

THE IRON AGE

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FOREWORD

THE cells of the human body are constantly being discarded and renewed, so that after the lapse of a few years one is not the same person as before. The likeness and personality remain but the cellular components of the person are largely newcomers.

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Industry, too, and its technique are constantly changing. One might be safe in saying that at least 80 per cent of our industrial methods are so completely modified during a ten-year period as to have but slight resemblance to their predecessors.

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Look back, if you please, to American industry just after the World War. In what respect does the general technique of making things today differ from that of a dozen years ago? What phase of this technique has undergone the most outstanding development and has had the broadest influence?

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Without doubt, the answer to the first question will be that the spread of the mass production and mechanization ideas constitutes the distinguishing

characteristic of recent years. And to the second, it is that a transformation in means and methods of mechanical handling has contributed most to the realization of the new concepts.

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Changes in our technique since the war have been gradual and hence we do not realize the great contrasts between then and now. But they exist, nevertheless, and we can see them everywhere—in the continuous sheet mills, in our mechanized foundries, in the machining and assembling of a thousand products, in the painting and finishing of metal goods and machinery. Moving has become the larger part of making.

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Because of the broad and constantly increasing influence of mechanical handling upon all branches of technique in the metal-working industry, we are devoting considerable space to this subject in this number of *The Iron Age*. In no other field are the possibilities for the profitable application of mechanical handling so general and so numerous. And it is quite fitting that the industry which produces the means of handling should be their chief beneficiary.



Handle with

MECCHANICAL handling is the backbone of mass production. But what is mass production? Ask ten men and you may get five different answers.

One might say that it is producing things in great quantities. But one would hardly call coal mining or wheat farming mass-production industries. And is it not quite possible for small production volumes, say of a hundred or so simple units per day, to qualify for the title? I think so.

William Knudsen, president of the Chevrolet Motor Car Co., has a definition for mass production. He says it is "standardized quality" production. Mr. Knudsen ought to know. According to his definition, quantity does not cut so much figure.

Even this seems to leave us a bit up in the air, however, for, while standardized quality brings in the thought of tolerance and inspection, it does not introduce the thought of mechanization. And that certainly is a part of the modern mass-production idea. Then, too, comes the thought of straight-line flow.

We might define it as "mechanicalized, straight line, standardized quality, repetitive production." But that's a real mouthful of adjectives. Perhaps we had better call it quits and let it go as mass production.

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A ONE MAN PLANT

THE cigarette making machine is a wonderful example of a completely mechanicalized one man, mass-production plant. The machine does the work, the man does the loading and unloading. It is a plant that is crammed full of mechanical handling apparatus. Next time that you have opportunity to watch one of these machines at work, notice what a large percentage of the making of a cigarette consists of handling. And that is quite true as regards the making of most any product in any plant. As a rule, the actual machining, forming, stamping or other operations which change the shape or form of the product are accomplished in a few seconds. It is handling that eats time. Inefficient handling.

The man who designed the cigarette making machine had a clear idea of exactly what portions of the process came under the head of "moving" and what came under "making." Having these facts, he was able to fit a suitable mechanical unit to each portion and tie them together so as to produce the greatest overall production efficiency. Most of us who are making products do not detect the hidden handling items which are concealed in nearly

Care! ▲ ▲ ▲

BY JOHN H. VAN DEVENTER

Industrial Consultant—The Iron Age

every operation, and in between successive operations. In addition to not paying any rent, some of these concealed star boarders are big profit eaters.

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DIAGNOSING AND PRESCRIBING

THE best doctors, before they prescribe, make a thorough diagnosis. It's a good rule to apply this principle in the curing of industrial handling ills.

Detailed time studies form the surest and safest diagnoses for industrial processes. Properly conducted they will show up the hidden handling items. This brings to mind a true story.

Actual costs were exceeding the theoretical by a large margin in a certain metal-working plant in Cleveland. Competition was keen and the plant manager put the question mark to work. He ordered highly detailed time studies made of each operation involved in making the product. "In particular," he ordered, "be sure to break down and time all of the indirect items. It is not the actual machine time that is costing us money."

When the results were sent in to the front office, the Ethiopian in the woodpile became visible. Indirect items, marked in red, aggregated considerably more than half the total time. "Picking up piece," "lifting and carrying," "reaching," "walking," "waiting for stock" and other such items appeared in abundance. "Seems to me," said the manager, "that we have been paying skilled operators for a lot of stevedore work." Action followed through which the process and equipment were rearranged and a suitable handling system installed, resulting in new actual costs which beat the old theoretical ones.

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IT'S GETTING HARDER

IN these days of alloy steels, automatic production machines and other tools of infinite variety and complexity, of cranes, hoists, belt, bucket and slat conveyors, of tractors and elevating trucks, of monorail systems and tiering machines, the works manager must combine diplomacy with an infinitude of knowledge. He should be twins.

Delegate, he can, but abrogate he cannot. For one man must coordinate and to coordinate he must know. Especially must the works manager know the means and methods of mechanical handling, for it enters and affects every department of his plant and it, itself, is a universal process coordinator.



Form 10027-A
W. E. & M. Co.
Works Dept.
Printed in U.S.A.

No. 181736

S.O.
Dwg.
Style
Patt.
Etc.

From

To

SHOP EXPRESS

No. 181736

From

To

(PLEASE PRINT PLAINLY)

No. 181736

SAMPLE tag used in dispatching packages by the truck route. The lower stub is held by shipper as shipping record. The second stub, detached by truck driver at delivery, is stamped on back with delivery station number upon reaching that station. Top or main portion remains with material as identification.

HANDLING SMALL PACKAGES BY SHOP TRUCKING SYSTEM

KEEPING all departments clear of an accumulation of small loads destined for others, and serving all at about one-hour intervals, the trucking system here described has merits which ought to appeal to many plant managers. It is sufficiently flexible to fit a variety of cases and needs.

A SHOP-EXPRESS plan for handling small packages by means of industrial trucks running on scheduled routes is in operation at the East Pittsburgh plant of the Westinghouse Electric & Mfg. Co. This is described in some detail in a paper, by C. A. Fike, superintendent of plant transportation department of that company, to be read, April 16, before the National Industrial Congress, Cleveland. This paper is being presented through the American Society of Mechanical Engineers, and is here abstracted.

When material is required from the storeroom on special or short orders, and is handled by a messenger, this furnishes one of the hidden costs of manufacture. The messenger may be a clerk or supervisor, whose time will not appear as a material handling charge. Requirements may demand the delivery of an order from section to section in small lots. Small amounts of special material from outside suppliers must be distributed. Movement of small articles between shop and office is a daily occurrence.

Unless this is provided for by a special set-up the cost per package handled, when calculated, is likely to show startlingly high figures. Cases have been found where it was more costly to move a package 1000 ft.

[A somewhat similar method of handling interdepartment shipments was described in THE IRON AGE of April 4, 1929, page 935. That described the use of trucks, running on scheduled routes, at the National Cash Register plant, Dayton, Ohio.—EDITOR.]

in the shop than to move the same package from Pittsburgh to Cleveland.

Based on Preparatory Studies

A SURVEY of the entire plant showed the extent of shipment of these packages and developed the percentages which were of a size to be considered under the heading outlined. All of the data were collected and assembled with an outline map of the plant, showing the flow of material. In general, this covered principally the routes having the largest amount of this sort of movement.

In determining how to handle this material, it was necessary to settle the size and weight limits of packages, frequency of the service, containers, shipping and receiving stations, the kind of truck body best suited to the work, together with shipping instructions, checking and recording deliveries. It finally was determined that a weight limit of 100 lb. and a bulk limit of the standard shop tote pan, 6 x 12 x 24 in., should govern.

Certain exceptions were made in special cases, in the interest of eliminating messengers and trucks which had been devoting much time to the special cases. Thus a flexibility is retained and so used that a saving can be made.

Frequent service is a fundamental. In laying out the routes, the cycle must cover the entire plant, but

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THE shop express truck, showing body construction and mounting. Note the lifting lugs for easy handling when the body is to be removed for maintenance work.

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not always in a direct line. Digressions are made from a straight line to make short-time deliveries between heavy shipping sections, where time is at a premium. One example of this is the shipment of parts on customers' service orders, so as to furnish almost immediate service between finished parts storeroom and the shipping department.

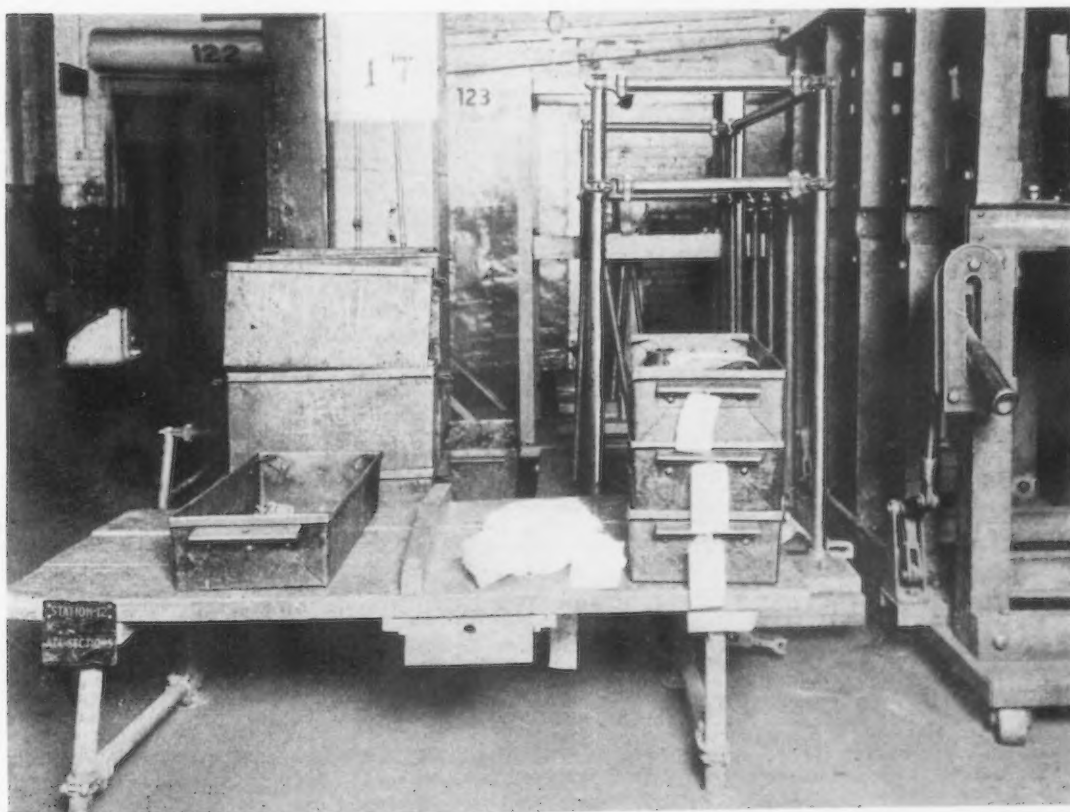
Containers received and shipped, platforms and truck bodies must suit one another. Materials must be packed to be handled easily and quickly, with the least chance of damage or delay. The standard tote pan is generally adopted; for smaller goods a sack is used; for large, single pieces of material no container is needed. The main thing is that each shipment, regardless of the number of pieces, is so packed or tied that it can be handled as one unit.

Shipping and receiving platforms are small benches, 3 ft. x 6 ft. x 18 in. high, with a wood strip

division in the center. One side of the division is used and marked for outgoing material, the other for incoming material. Truck bodies have undergone an evolution in design to facilitate safe transportation and rapid handling.

Keeping Track of Shipments

Checking on deliveries must be simple. The method adopted involves the use of a serially numbered tag with two detachable stubs. The first stub is removed by the shipper and retained as a shipping record. The second stub is removed by the truck driver upon delivery to the proper receiving station. The back of this stub is stamped at the receiving station, as evidence of delivery. The remainder of the tag remains on the material as identification. The stamped stubs, turned into the central transportation office after each run, are filed by date and serial num-



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Shop express receiving and shipping station, showing construction and marking and also the standard container. In the small drawer below platform the delivery stamp is kept, and a small supply of tags for the shipper whose use of the service is small.

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ber and form a means of checking delivery of material.

Care was used in selecting the truck drivers. They must be interested in the job, and a good memory is essential. They must be active and alert, as the schedule laid out makes no provision for time for loitering. To maintain their interest, the work was placed on an incentive basis. Payment is made on the number of packages handled, as checked by the tag stubs.

In the beginning about 500 packages a day were handled.

Shop Express Annual Cost		
Operating (labor and I.F.E.) 12x\$130x3	=	\$4,680
Annual depreciation on depots (3-year basis) 85 x \$3.20	=	272
Annual depreciation on truck bodies (2 year basis) 3 x \$20	=	60
Annual maintenance, taxes, etc. on trucks, 3 x \$66.50 x 12	=	2,400
Annual interest on investment at 6 per cent		
85x \$9.50=\$800.00		
3x\$2,000.00=6,000.00		
3x 40.00=120.00		
	=	415
		\$6,920.00
Annual total		\$7,827
Average deliveries a month = 20,000		
\$7,827		
20,000 x 12	=	\$0.0326 per delivery, which is around actual costs.

* This item is not altogether accurate, owing to depreciating equipment at different rates, and also to principal decreasing each year. Therefore, some allowance should be made.

During the first year it was found possible to dispense with about 15 messengers who formerly had carried packages. Supervisors responsible for manufacturing costs found it was cheaper to use the shop express at a cost of 2½c. to 3½c. a package, rather than a messenger at 35c. or 40c. an hour.

Originally three routes were in service, each covered by a truck in about 2 hr. At the end of each trip the trucks met at a central station and exchanged packages from route to route. This gave a delivery time averaging about 1¾ hr., with a maximum of 4 hr. It was felt that this period was too long.

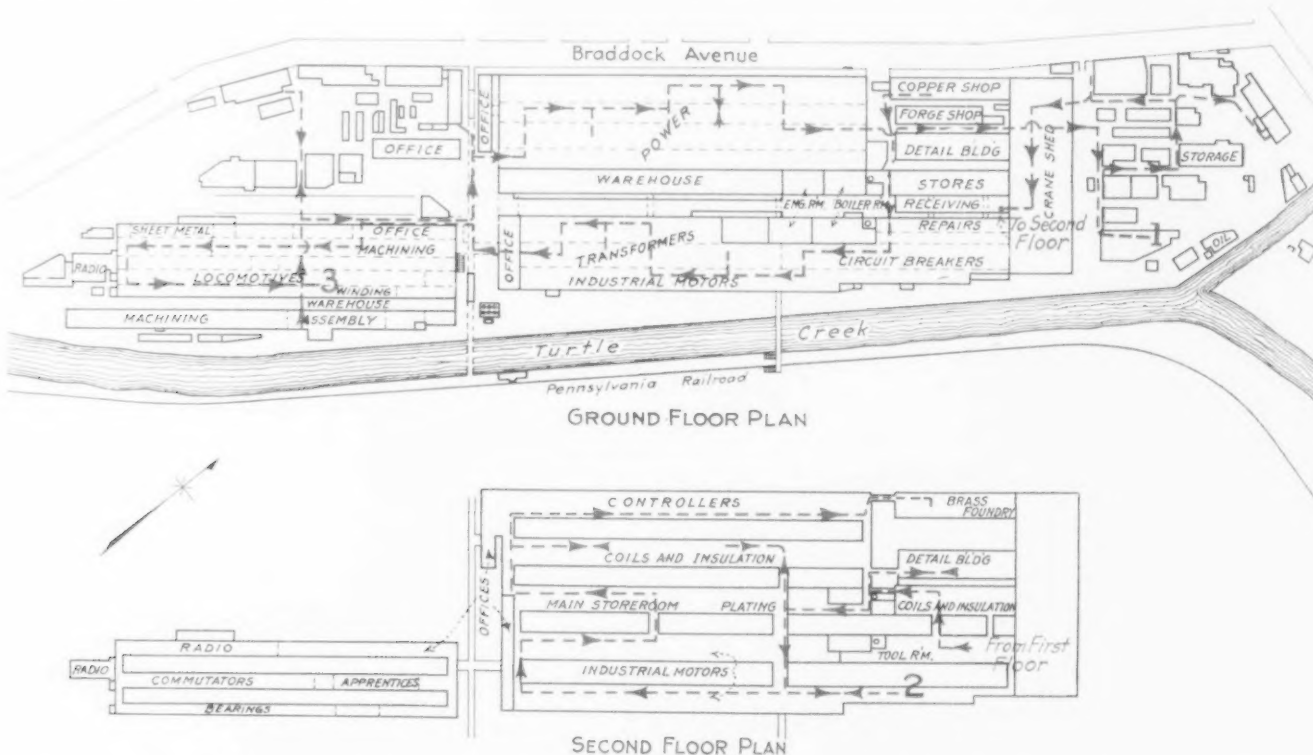
Changed from Three Exclusive Routes to One Three-Truck Through Service

One route therefore was laid out covering the entire shop. The trucks start at different points on the route, so that there is about an hour's difference in their individual time schedules. This gives hourly service to all sections, and reduced the average delivery time to about one hour and the maximum to 2¼ hr. The route was so laid out as to give especially quick service to sections doing a heavy amount of shipping or receiving.

Another advantage in this change in routing, making for greater flexibility, is that trucks can be added or removed in accordance with the load demands. It has added to the capacity of the truck service through eliminating need for carrying packages to a central station and sorting them for final delivery. The distance packages are carried has been decreased and there is less handling of individual packages. From this cause breakage and loss have been lessened.

About 1200 packages now are shipped each day and the records have shown about two a month lost or missent. From this record, it was found possible to eliminate the expense and lost time involved in individual signatures and checking on receipt of packages as proof of delivery. The stub is easily stamped with a rubber stamp at point of delivery and that suffices.

About 10 telephone calls a day are received concerning shipments. These are checked up and an-



Routes of the three trucks on the ground floor and second floor of the main Westinghouse plant at East Pittsburgh. No. 1 truck starts its scheduled travel at point marked 1, while simultaneously No. 2 truck starts at 2 and No. 3 truck at 3. Each of the three trucks covers the entire route as shown, with an interval between them of about 1 hr.

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Driver delivering material to a receiving station. This provides a close-up view of the truck body, station bench and a standard body.

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swered immediately. This often saves argument between manufacturing sections. It also saves production delay by showing at all times the location of material.

Two items in the plan are considered of primary importance. These are the wage incentive and the shipping instructions. The incentive plan gives the

drivers an opportunity to increase their earnings by increasing the number of packages handled. This encourages them to solicit business by careful and fast handling of work. The shipping instructions enable the shop sections to tag, mark and check their shipments properly, and made it easier for the transportation department to get the plan into operation.

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Iron-Carbon-Aluminum Alloys

ADDITIONAL information concerning the influence of aluminum on the iron-carbon system has been contributed by O. v. Keil and O. Jungwirth (*Stahl und Eisen*, Nov. 20, 1930). Melts of Swedish iron with electrode graphite were alloyed with technically pure aluminum. The formation of a superficial layer of richer aluminum and alumina on melts rich in aluminum is an indication of immiscibility phenomena in iron-aluminum alloys.

The investigation showed that, at 2 to 3 per cent aluminum, practically all the carbon is graphitic, while on increasing the aluminum content to 11 per cent the graphite disappears entirely, but at 18 per cent aluminum the carbon again becomes entirely graphitic. The eutectic temperature of iron-carbon alloys is gradually raised by the addition of aluminum until at 14 per cent aluminum 2375 deg. F. is reached. Further increase in aluminum content is accomplished by a gradual decrease in eutectic temperature. The eutectic concentration of carbon is decreased about 0.16 per cent by 1 per cent aluminum. The pearlite point is somewhat lowered by adding up to 3.5 per cent aluminum, and then it climbs again to 8 per cent aluminum. The constriction of the gamma region of the iron-

aluminum diagram at high-carbon contents was observed up to 8 per cent aluminum.

Hypo-eutectic melts containing less than 5 per cent aluminum exhibited finely granular graphite produced by metastable solidification and spontaneous decomposition. Between 5 and 9.5 per cent aluminum the borders of the primary crystals of solid solution exhibit a decreasing amount of decomposition, a fact attributable to sluggish diffusion. These zones are especially subject to attacks by acids. Above 9.6 per cent aluminum the solid solution does not decompose; it is poor in carbon, easily soluble in acids, and microscopically homogeneous. A eutectic is formed with a second phase, presumably an iron-aluminum carbide. Melts with higher carbon contents show the presence of graphite but their structure is not clear.

Alloys with 12 to 19 per cent aluminum show no primary graphite in the hyper-eutectic range. The eutectic consists of the two carbide phases mentioned above, and one or the other is evidently the product of primary crystallization according as the alloy lies in the hypo- or the hyper-eutectic range of composition.

AUTOMATICALLY CONTROLLED GAS-FIRED JAPANNING OVENS

By J. B. NEALEY,
American Gas Association, New York

ENAMELING or japanning metal parts has become so popular in industry in general that jobbing plants, erected exclusively for this kind of work are no longer a novelty. Dipping and baking are the major operations. The equipment has gradually grown from the hand method, with small periodic ovens, to great installations in which the work is dipped and carried through the ovens on continuously moving conveyors. The ovens are even automatic as to temperature control and baking periods, employing gas as a fuel.

One modern plant of this kind is that of the Stone Enameling Co., Detroit, where the bulk of the work includes finishing automotive and gas stove parts and other miscellaneous steel stampings. Three semi-automatic japanning ovens and one that is fully automatic constitute the principal equipment, and afford all the flexibility required by the fluctuations in production schedules peculiar to jobbing plants.

All the japanning ovens are heated indirectly, separate gas-fired heaters being employed and the hot products of combustion forced into the ovens with motor-driven fans. The work, steel stampings, is first put through a burnoff oven to free it of grease, etc. This oven, a box-like structure of sheet steel and asbestos, 10 x 20 ft., is heated directly, two long gas pipe burners located close to the bot-

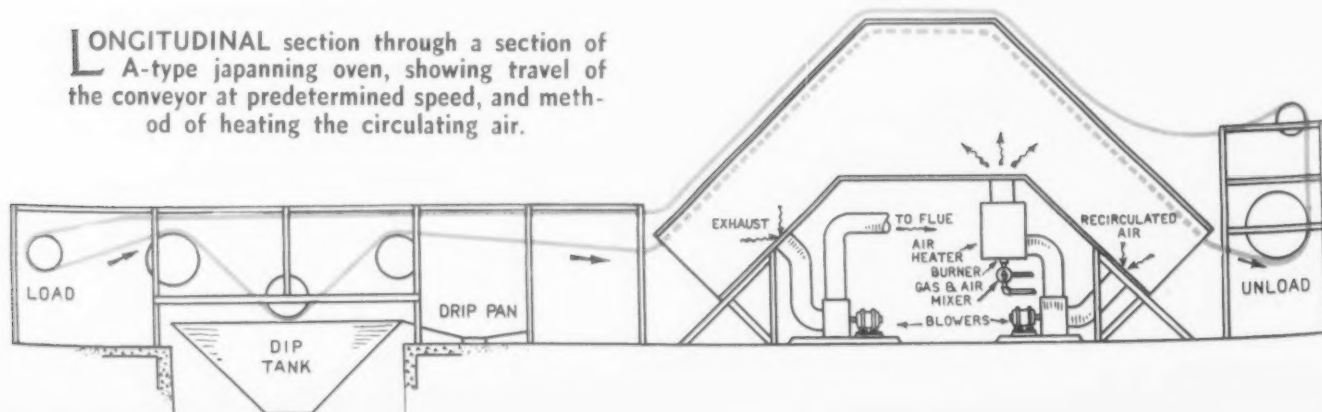
tom being utilized. A temperature range of 600 to 700 deg. F. is used and the burnoff period varies from 15 to 20 min. This treatment is followed by sanding and wiping. The work is hung on steel racks with casters for charging and discharging into and out of the oven.

Baking on the First Coat of Japan

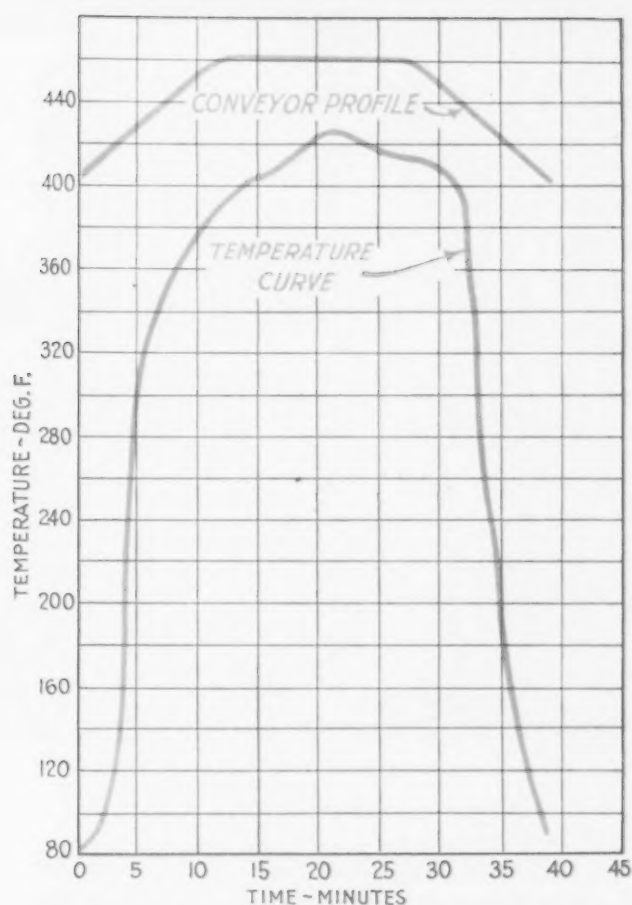
First-coat work is baked on in the three semi-automatic ovens, which also are constructed of sheet steel with asbestos insulation. One of these is 20 ft long, 8½ ft. wide and 9½ ft. high, while the other two measure 10 x 20 ft. x 7¾ ft. high. With doors at both ends, these ovens are equipped with overhead, motor-driven conveyors consisting of two parallel endless chains, with rods between them on which the work is hung. These are all in the horizontal plane and each extends 25 ft. beyond each end of its particular oven. The lower portion runs through the oven close to the top, and returns just above the oven.

Operators dip the parts in tanks of dull-finish japan (29 deg. Baumé) and hang them on the conveyor rods. When these are full they open the doors at both ends of the oven and start the motor which moves the conveyor along. The wet work enters the oven and the load that has just been baked moves out at the other end. Operators then remove the baked parts and hang them on to an overhead mono-

LONGITUDINAL section through a section of A-type japanning oven, showing travel of the conveyor at predetermined speed, and method of heating the circulating air.



A CONTINUOUS japanning oven of the A-type, served by an endless belt conveyor on which the material is dipped and carried through for baking, is here described. The heating cycle is worked out so that automatic temperature control through the use of gas fuel is practiced. And speed control is tied in with it. The oven is heated indirectly, and the dipping and dripping sections are inclosed in glass to avoid dust deposit on the work.



TEMPERATURE curve within the oven for a period of 39 min. During 28 min. of this time the temperature has been above 300 deg. F. Conveyor speed was 17 in. a minute.

rail conveyor, which takes them to the dip tanks ahead of the second-coat oven.

Automatic Unit for Second Coat

The second coat is applied and baked in the fully automatic unit—an oven of A-type constructed of sheet steel with asbestos insulation. The entire unit, from dip tank to discharge end of oven, or the distance between the sprockets of the traveling conveyor, is 105 ft. The oven, about 51 ft. long, 9 ft. wide and 11 ft. high, consists of two end parts which rise at a 45-deg. angle from the floor and a horizontal central section 14 ft. above the floor. With this A-type structure most of the heat is trapped in the top for effective use.

A space about 60 ft. long, on a line with the oven and including the dip tank, is glassed in to the width of the oven. This forms an air-tight room in which to dip the work and hang it on the oven conveyor, thus eliminating the possibility of dust settling on it. All air admitted to this inclosure, and to all of the first-coat department, is filtered and washed and its temperature controlled by unit gas heaters. The oven is of the counter-flow type and the neutral point is close to the charging end.

Filtered Air Forced In

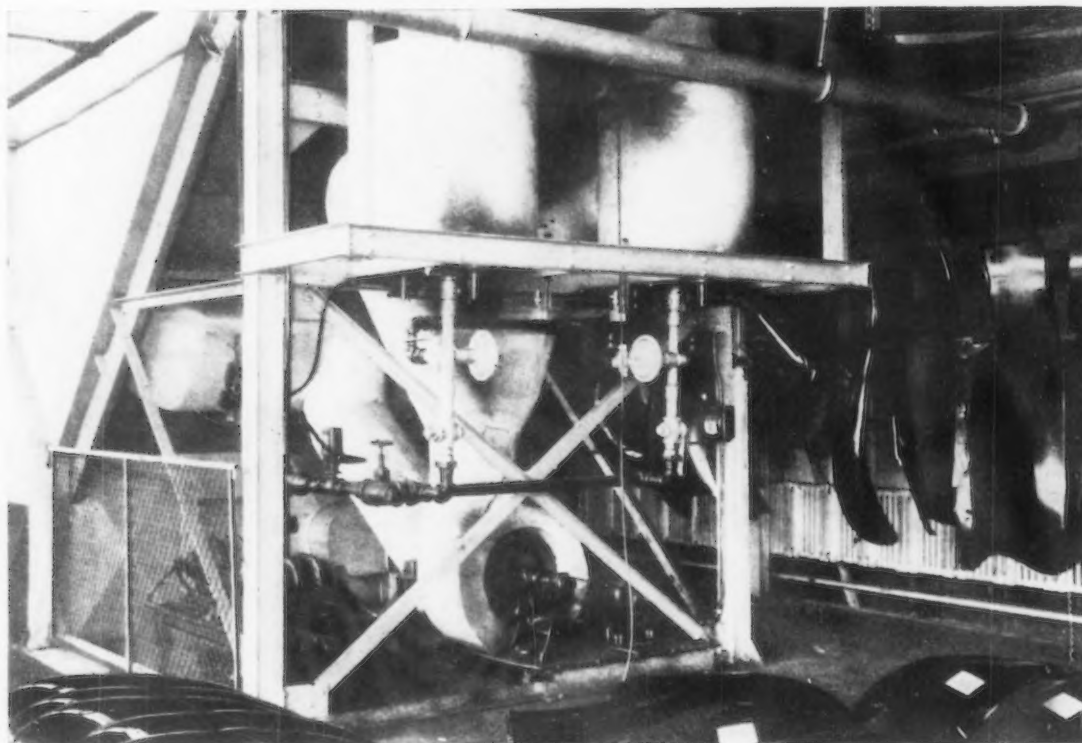
At the further end of the glass inclosure is a motor-driven fan delivering 2000 cu. ft. of air a minute into the inclosure. At the exit end of the oven is

another fan which delivers 5200 cu. ft. of filtered air into the oven and forces it toward the loading end. The heat from the heaters is admitted to the oven through two ports in the bottom of the exit side of the upper section and is carried toward the loading end by the draft.

A single exhaust flue is located in the center of the bottom of the first leg of the oven, close to the neutral point. The amount of air exhausted and the position of this neutral point are controlled by the speed of an exhaust fan located in the exhaust flue. The waste products of combustion are vented to the outside air. In the winter the filtered air blown into the oven is heated with steam coils to about 85 deg. F.

The oven is heated from two cross-horizontal tube heaters, fired with gas, entirely separate from the oven, and located beneath it. Each is fitted with a gas burner and venturi tube, air being supplied at high pressure and the gas inspired in the proper ratio for complete combustion. Recirculated air is drawn through the tubes, where it is heated and then blown into the oven, which it heats in turn to 450 to 475 deg. F. The burner and venturi are all one casting, which is bolted into the front casting of the heater. The heater is circular in shape, formed of sheet steel and insulated to prevent loss of heat through radiation.

Two indicating automatic temperature control-



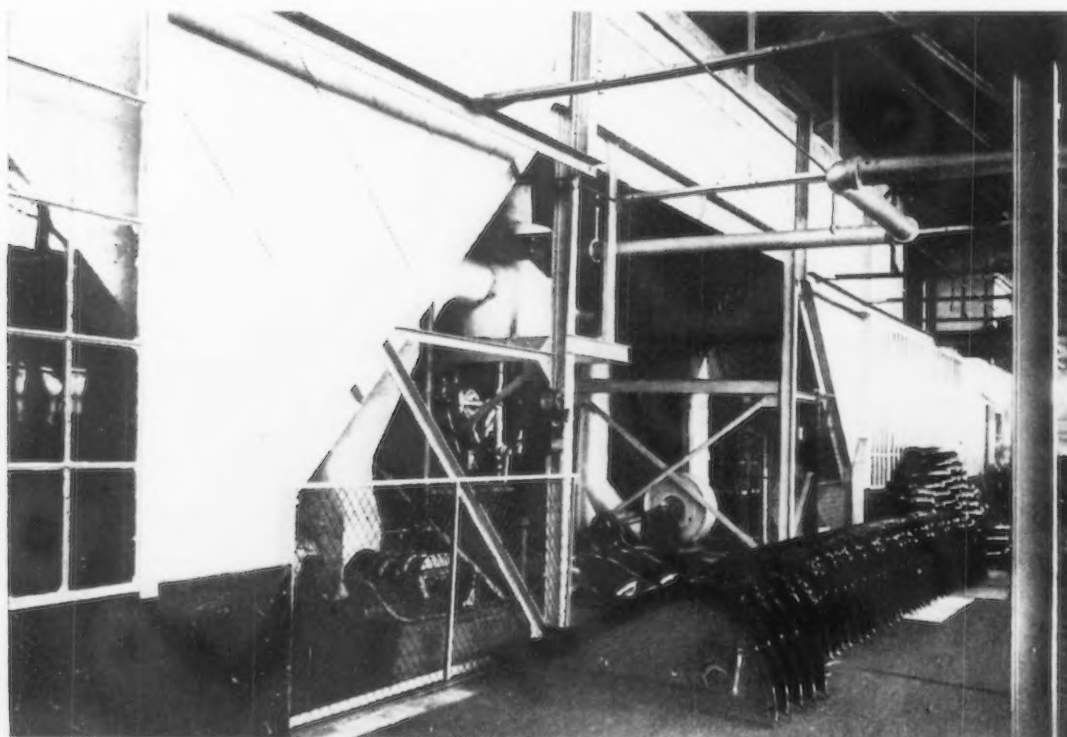
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PART of the ventilating system for baking oven, with a portion of the charge passing in background, hung from chain conveyor.
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lers, connected with solenoid-operated valves in the air-supply line, keep the temperature under constant control. When the temperature rises above the predetermined point the valve closes in the main line, and only enough to support a small flame comes through a by-pass. Conversely, when the temperature drops the valve automatically opens to restore the hot flame.

It has been found that one heater is sufficient to maintain a baking temperature of 475 deg. F. during the greater part of the time. In fact, the heaters run on the low flame approximately 60 per cent of

the time. The work remains in the oven for a baking period ranging from 45 to 60 min., according to the class of work. On starting up this oven cold, say Monday morning, the burners are not lighted until the conveyors and work are going through the dip tank. This indicates the quickness with which the oven heats up. A blower delivering 2000 cu. ft. of air a minute forces the air through the heater into the oven.

Included also with the automatic temperature control are safety pilots for the heaters, a safety shut-off valve and a vertical air-flow relay. The dip



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GAS-FIRED air heater placed under the raised section of the A-type oven. At right is the glass-inclosed space protecting the wet work from dust.
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tank is of the inverted apex type, 21 ft. long on the top, 8½ ft. wide and 8½ ft. deep, and is constructed of plate steel ¼ in. thick. Beneath is a fire tank 6½ ft. in diameter and 18 ft. long and a clarifying system which includes one straining tank with bronze screens and a pump direct connected to a 1-hp. motor, for circulating the japan through the filter. The japan used for the second coat is of 30½ deg. Baumé.

Fire protection for the entire plant is had through a carbon dioxide installation, with fusible

links at key points which let go if the temperature rise should exceed 70 deg. F. a minute. The same system automatically shuts down all machinery and closes all fire doors in the plant.

Work coming out of the second oven is usually loaded directly for shipment, a curtained opening in the oven room wall being used to pass it through directly on to the loading platform. A fleet of two trucks, a tractor and five trailers are maintained for local deliveries. These are provided with special racks and felt pads to prevent scratching.



Use of Silicon Steel in Montreal Bridge

SILICON steel was used for all the main truss members for the hinges of the floor beams and most of the bottom lateral systems on a new highway bridge recently completed across the St. Lawrence River at Montreal. This bridge has a main span between centers of piers of 1097 ft., and a total length, including approaches, of 8817 ft., or about 1 2/3 miles.

This silicon steel was required to fill specifications calling for ultimate strength of 80,000 to 90,000 lb. to the square inch, with a yield point of not less than 45,000 lb. Associated with this strength a ductility was specified represented by an elongation, in 8 in., equal to 1,500,000 divided by the ascertained ultimate strength of the specimen investigated. Contraction of area was specified at 35 per cent.

As described in an article in *Engineering* (London), this steel proved to differ markedly in its characteristics from the special carbon steel used elsewhere in the bridge, and particular care was necessary at the mills to insure freedom from segregation. A large fraction of each ingot had to be removed by cropping. The defects most commonly encountered in subsequent working of the material were hard spots and pipes. Rigidity of inspection at the steel works, however, kept the total of rejections in the bridge shops at a low figure.

This silicon steel was much harder on the machinery than the carbon steel. When sheared or punched it gave way with a sharp report and the fracture was much more crystalline than with the other steel. These peculiarities resulted in an increase of some 25 to 35 per cent in cost in fabricating this steel, compared with the carbon steel.

For tension members a working stress of 23,500 lb. to the square inch was adopted with the silicon steel. In compression members two methods of calculation were specified, the lower result being adopted in each case. One of these was a straight 19,000 lb. to the square inch, while the other was given

by the formula
$$\frac{L}{R} 22,000 \text{ minus } 100$$

Erection stresses previous to closing the central panel of the suspended span were permitted to go as much as 25 per cent above the stipulated figures.

It was found that the load on the anchor and cantilever arms at this time would be considerably greater than it ever would be after completion of the bridge. Calculation of erection stresses provided not only for the weight of the structure and the travelers and other erection gear, but also for a wind load of 30 lb. to the square inch over the entire exposed area.



Artificial Lighting Simulates Daylight

A NEW development in factory lighting has resulted from research conducted to devise methods of artificial lighting for a windowless factory being built for the Simonds Steel Industries at Fitchburg, Mass., by the Austin Co., Cleveland. The lighting was one of the most important problems to be solved in connection with this 360 x 560-ft., one-story, windowless building.

A combination of incandescent and vapor illumination has been selected. Lighting provided by this combination is said to be free from glare, does not create sharp, black shadows, is easy on the eyes and shows up small objects in fine detail. Tests are claimed to have proved it superior to daylight in its effect on labor efficiency.

More than 700 lighting fixtures are being made for the plant at the Hoboken, N. J., works of the General Electric Co. A single unit consists of an oxidized aluminum reflector, 12 x 26 in., of a shallow pan shape with the illuminating units mounted in the reflector. Some of the tubes will be quartz glass. The unit as a whole operates on 110-volt alternating current. The lighting units will be attached to the welded steel trusses overhead and provide a lighting intensity of 26 to 27 ft.-candles on the working plane. The result of the unit in operation is said to be a fine blending of incandescent and vapor types, so that natural daylight is reproduced.

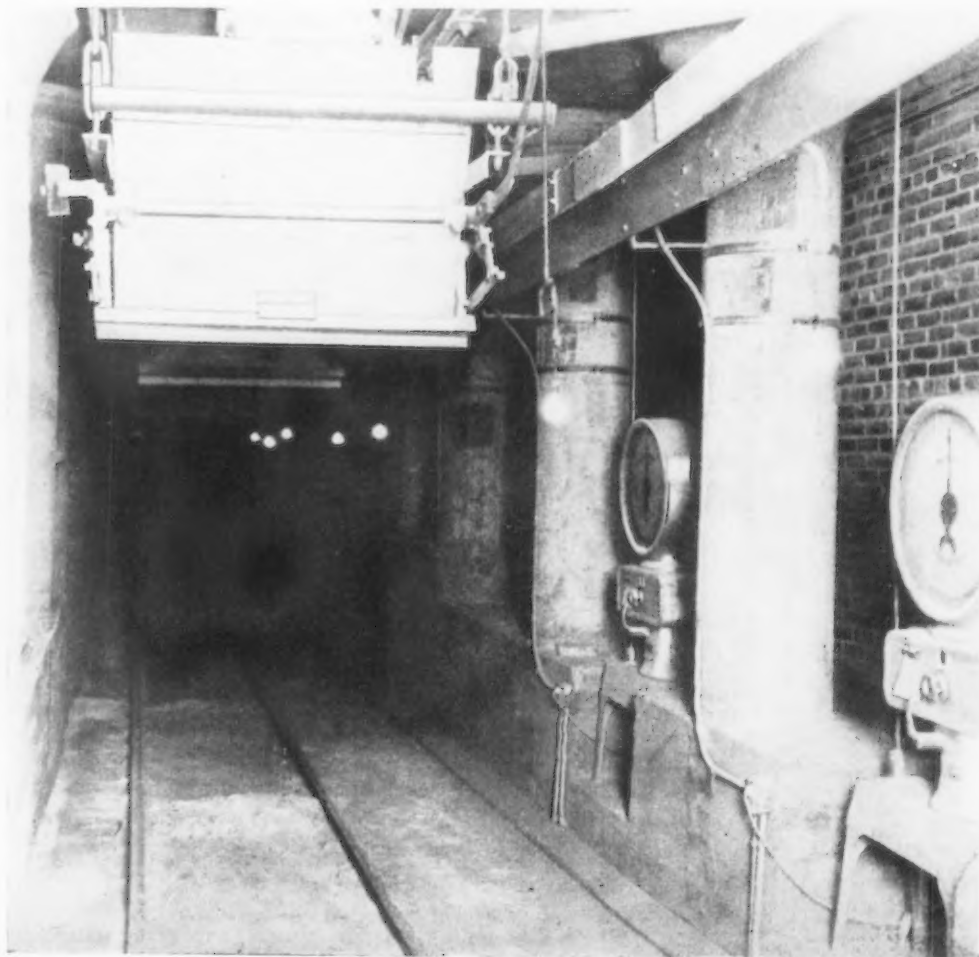
An interior color scheme to supplement the creation of definite light rays has been developed by engineers of the Austin Co. The walls, ceilings, floors, trusses and machinery will be of special harmonizing colors, with a view to providing maximum comfort for employees and greater working efficiency.

WEIGHING AND COUNTING DEVICES FOR MATERIALS HANDLING



MATERIALS handling and weighing operations have always been associated with each other. Descriptions of a large number of devices used in weighing and counting materials, in connection with their handling in industrial plants and otherwise, are covered in a paper to be read before the American Society of Mechanical Engineers in Cleveland on April 16. This paper was prepared by A. B. Jacobus, of the Fairbanks Co.

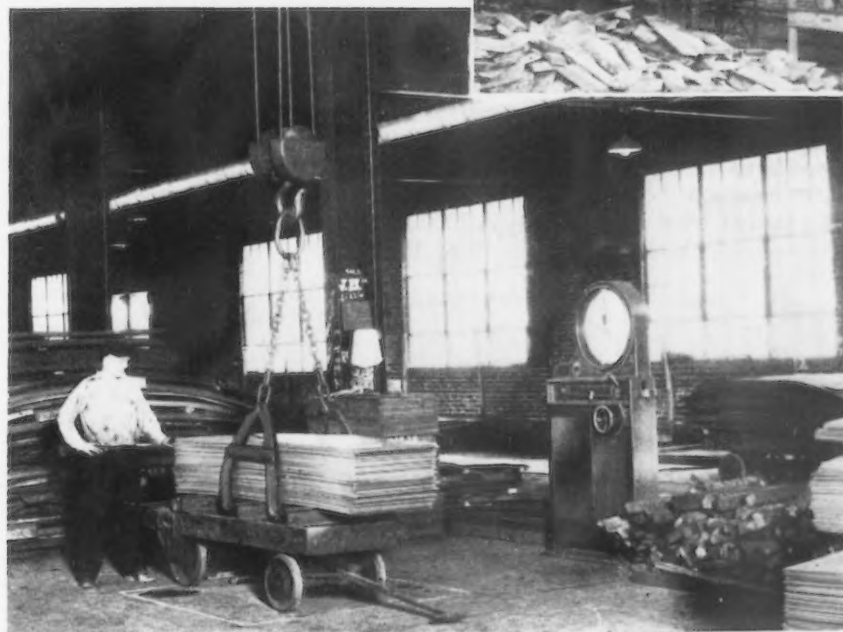
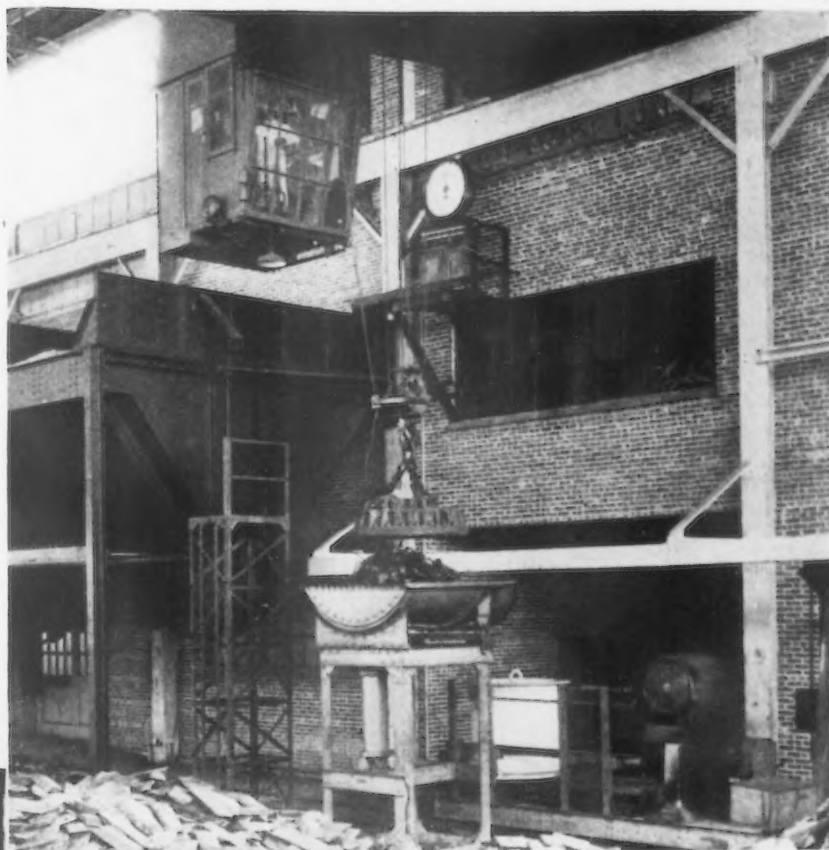
A number of the illustrations, together with brief descriptions of what they show, will be found on this and the following pages. This article represents, therefore, an abstract of some of the essential points brought out in the prepared paper.



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BATTERY of suspension hopper batching scales used for weighing out ingredients at a hopper for batch mixing in an industrial plant. The scales are suspended from bins and the hoppers are suspended from the scale levers. Dials are alongside the track, as shown. Accuracy is said to be 0.1 per cent.

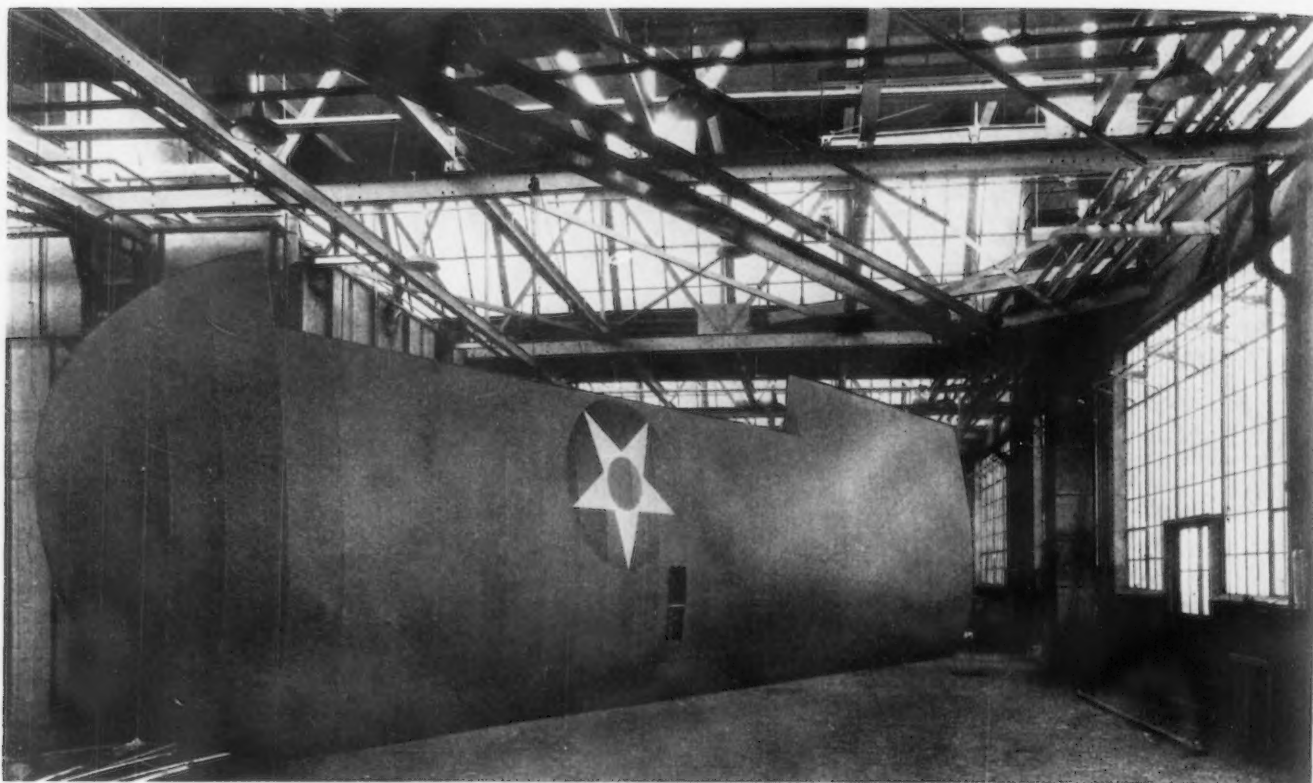
FOUNDRY cupola charging scales with capacity up to 5000 lb. This scale has loading capacity to 30,000 lb. to provide for the impact of metal dropping from the magnet into the pan. The dial on the wall may be read easily from the crane cab. When the charge is made up, the pan is tilted and the metal dumped into the bucket on the transfer car. While maintenance expense is an item on this type of equipment, its accuracy is said to be within 0.5 per cent.



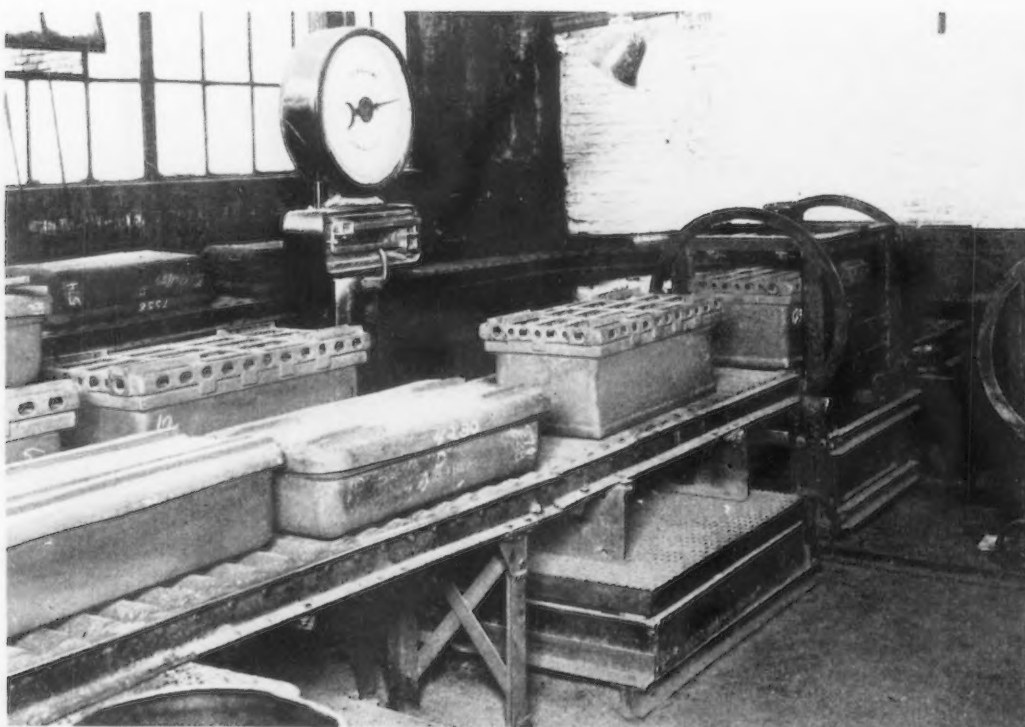
BUILT-IN dial platform scale with provision to take care of impact and swinging of the load. Where the material is handled by high-speed cranes the impact may be several times the weight of the load. A load swinging from high traveling speeds may impart to the platform a horizontal force of more than its weight. These scales are built with capacity from 5 to 300 tons. Time in weighing is 6 or 8 sec. with dial, and 10 to 20 sec. with weigh beam. Accuracy may be maintained at 0.1 per cent.

WEIGHING hot metal on railroad track scales. The car has capacity of 150 tons of liquid metal with a gross weight of 343 tons. The scales are of two-section knife-edge type, with 500-ton capacity and a weigh rail 56 ft. long. The registering beam has capacity to 400 tons.

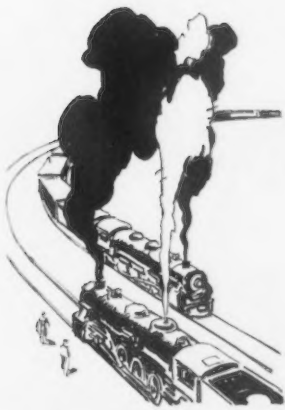




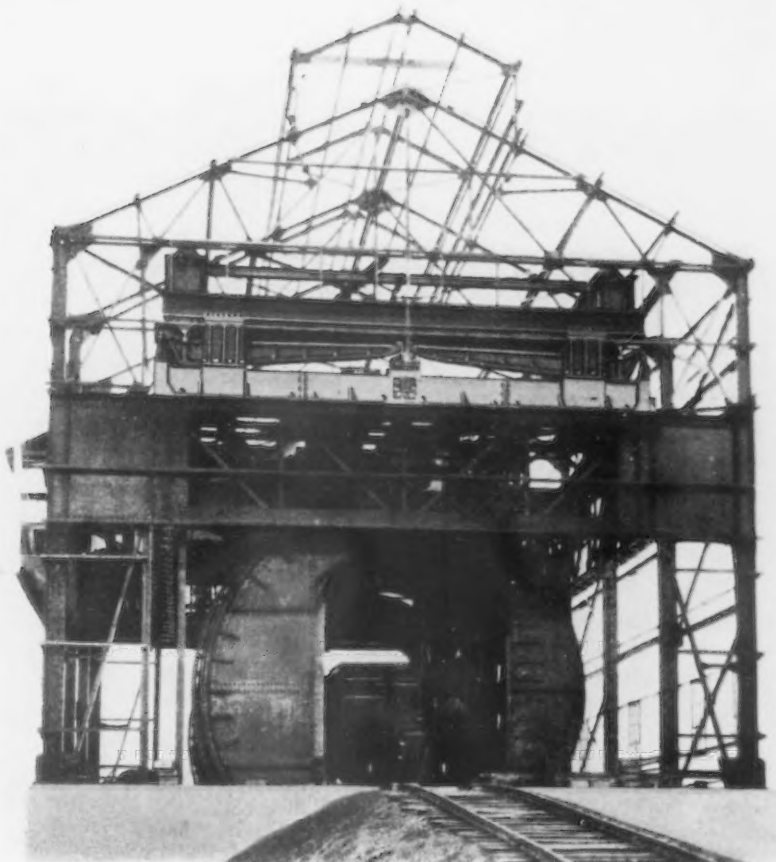
MONORAIL track scales used for weighing airplane wings and other parts. A 40-ft. track section is suspended from the scale levers and, in the picture, is weighing a wing section 42 ft. long and 11½ ft. wide. The scale, of the suspension pipe lever type, is suspended from the overhead building structure, the weighing beam being on the wall at lower right. This scale has sensitiveness of 4 oz. with a load of 1 ton. Its capacity is 2000 lb. at each end of the live rail. Weighing time is 15 to 20 sec.



SELF-CONTAINED dial platform scales associated with roller conveyor. The section of conveyor carried on scale is used for weighing boxes of material going to heat-treating furnace. Scales have loading capacity from 1500 to 6000 lb., and dials register one-third of those amounts. The excess loading capacity is provided because of the large volume of weighing handled over this installation. Weighing time is 6 sec. Accuracy may be maintained at 0.1 per cent.



○ VERHEAD plate fulcrum car dumper scale used with rotary car dumper. The scales are supported by the building structure and the dumper suspended from them. Fulcrum plates are used, instead of the usual knife-edge pivots and bearings, for transmitting the load through the lever system. Capacity is 400 tons and weighing can be maintained to 0.2 per cent of accuracy. Weighing time for one car is 12 to 15 sec.



PORTABLE dial platform counting scale for storeroom of manufacturing plant. This permits high speed in weighing and counting. The container of parts is placed on platform and the tare beam set for the marked tare of the container. Parts similar to those to be counted are placed in the ratio pan connected with beam housing, until one extra part will bring the indicator back to zero. Parts are then taken out of the container until the indicator stands at zero. Count of parts in the ratio pan, multiplied by the ratio, indicates the number in the container. Capacities are 250 to 1000 lb.



HANDLING THIN SHEET SCRAP IN TIN PLATE AND SHEET MILLS

CONTINUAL expansion in the use of thin sheet steel, both as tin plate and sheet steel, has carried with it an increasingly difficult problem in scrap disposal. This affects both the mills producing this material and the plants using tin plate and sheet steel as raw material in the manufacture of their various products, such as tin containers, automobile bodies, stampings of various nature, etc.

As a matter of interest, in the manufacture of black plate or tin plate the scrap will run from 16 to 17 per cent of the weight of bars rolled in the hot mill alone, with good practice. There is always some additional scrap made in other departments, such as the pickling, annealing, cold rolling and tinning, but the percentage is not nearly so great. There is also the question of tin scrap to be considered. This has to be handled in a different manner from black plate scrap, and will be taken up later.

In the manufacture of sheet steel of heavier gages than that used for tin plate, the scrap will run ap-

proximately 15 per cent of the weight of bars rolled in the hot mill. Thus the disposal of scrap in a tin plate or sheet mill is a matter that must be handled efficiently and expeditiously, or operations will soon be clogged, interrupted and hindered considerably.

Occurrence of Scrap in Mills

Scrap made in the manufacture of black plate is caused by the necessary allowance in the size of pack that is hot rolled, to permit cutting out the pattern-size sheets. There are always, also, some spoiled packs present which have to be cut up.

In former years there was a rather large market for cut-down sizes, i. e., sheets made from packs in sizes smaller than the size for which the pack was rolled. If the pack in question had a small defect, it often was possible to cut out a smaller size sheet, and not scrap the whole pack. But in recent years, with the present market conditions and the difficulty in obtaining a profitable price for cut-down sizes, it has become more economical to cut these packs up entirely at the scrap shears, rather than try to redeem

part of them. This has increased the amount of thin sheets scrapped.

With the great increase in tonnage of thin steel sheets used, there has come also the accompanying large increase in tonnage of thin sheet scrap to be disposed of.

The early practice in handling this sheet scrap was to cut it into narrow widths at the shears and bundle it by hand, tying it with two or three wires. This scrap was generally put into large boxes at the squaring shears by hand, and then carried by overhead cranes to the disposal place. Usually at that point it was dumped directly into gondola cars, to be shipped from that point

Magnet on jib crane loading the press box.



By H. H. GILES

American Sheet & Tin Plate Co., Monessen, Pa.



One hundred pounds of scrap loose, loosely baled and tightly baled.

to the open-hearth scrap storage or to the stock house.

As the tonnage of this scrap increased more and more, it became a larger and larger factor in open-hearth operation, and the necessity for improvements in handling this scrap became quite evident.

Some of the disadvantages of this early method of handling thin sheet scrap were as follows:

From the Producing Mill Standpoint—

High cost of handling

Cost of wire used in bundling

Frequent accidents caused by being cut with sharp pieces of scrap in the handling

Inability of getting a minimum carload of loose bundled material, thereby increasing freight cost

Increased cost of handling, and large amount of space required, in case it was necessary to store this scrap at the producing plant when at times the open-hearth could not handle it immediately after production.

The large amount of oxidation loss that would occur in open storage of loose thin sheet scrap.

The troubles incurred in using light-gage loose bundled scrap at the open-hearth are still more complicated:

At the Stock House—

Ordinary bundled and wired sheet or tin mill scrap has lost two of the three wires which are supposed to bind it.

It is difficult to handle with a magnet

Material falls from charging boxes upon the tracks, causing derailment, with resultant delays all along the line

Due to the necessarily incompact nature of this bundle, charging box loads are very light compared with other kinds of scrap

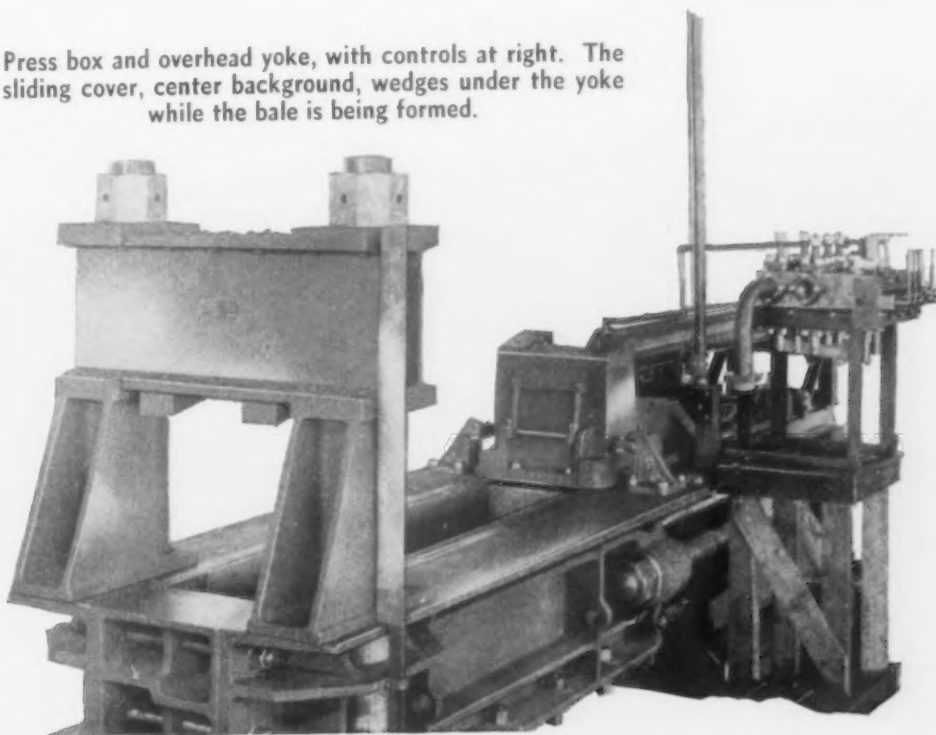
To improve this situation somewhat it is necessary to jam billets and heavy scrap in the boxes; this requires considerable additional labor.

Obviously, the matter of storage of such incompact material becomes very troublesome, and it litters the premises objectionably.

At the Charging Floor—

The number of buggies per heat is increased

Press box and overhead yoke, with controls at right. The sliding cover, center background, wedges under the yoke while the bale is being formed.



Delays are encountered in the charging of furnaces, which necessarily decreases the over-all output of the department.

To load the furnaces, as much scrap as possible has to be piled in at a time, due to its incompact nature. This sometimes makes it necessary to melt down part of a charge in steps, as it may be impossible to get the whole charge in at once.

At the Furnaces—

As may be judged from the foregoing, the loose bundled scrap has to be piled practically to the roof of the furnace, which results in throwing the flame against the roof, with resultant rapid deterioration of the roof brick. As the area of material exposed to the impinging gases is a maximum, there is an appreciable loss in weight of scrap from oxidation, sometimes over 20 per cent. Many light pieces of scrap are carried out of the furnace toward the stack, causing trouble and clogging up the checkers.

All of these problems, as outlined, were constantly being aggravated by the large increase each year in the tonnage of scrap to be handled.

Hydraulic Scrap Baler Solves the Problem

These problems were met by the development of the hydraulic scrap baler. When the first attempts were made to bale this scrap, the need was soon apparent for a very heavy, rugged, strong, fast and efficient machine. The designers and makers of the modern heavy sheet scrap baling press have now produced a press that will operate under constant heavy loads with a minimum of delay for repairs and upkeep.

In the early days of the development of thin sheet scrap balers, the troubles were many. It took some

time to impress on everyone concerned the tremendous stresses incurred in these machines; the strains imposed by the wedging of pieces of loose scrap between the baling head and the box, which the full 2500 lb. per sq. in. pressure of the pump could not dislodge; the necessity of developing adequate hydraulic packing; the necessity of developing efficient, quick-acting pumps and operating valves; the means of loading the bundled scrap into railroad cars.

In the early days, there were some cases where elevators carried the bundled scrap at a high level above the car, with the idea of distributing the bundles in the car by means of long chutes, and doing away with the necessity of moving the car as it was loaded. These elevators carried the bundled scrap to such a height that, when it was precipitated down the chute, the 250 to 300-lb. bundle often broke open, due to its own impact, or else damaged the wooden floor of the railroad cars.

Baled Scrap Commands Higher Price

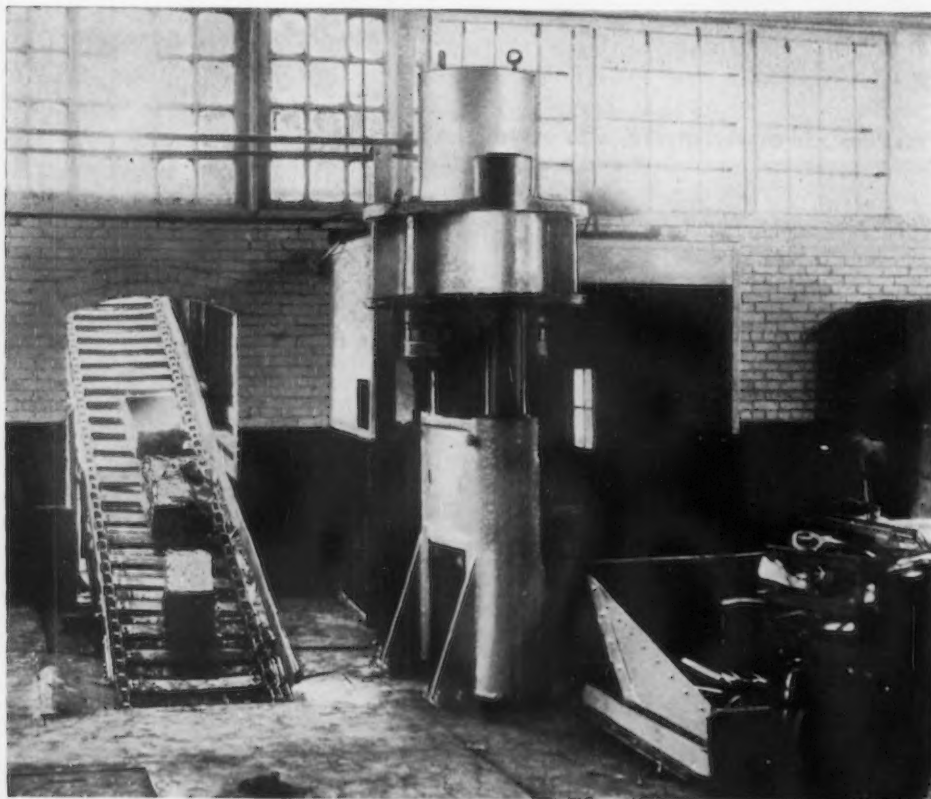
Due to the easier handling, and to the advantages to the open-hearth plants already enumerated, and several more not included in this paper, the open-market price for baled scrap is about \$2 a ton higher than for loose wire-tied bundled scrap. But there are cases, in heavy weights—No. 16 gage and heavier—where the open-hearth plant, working closely in conjunction with the sheet mill, can take such scrap cut up and bundled, and not baled.

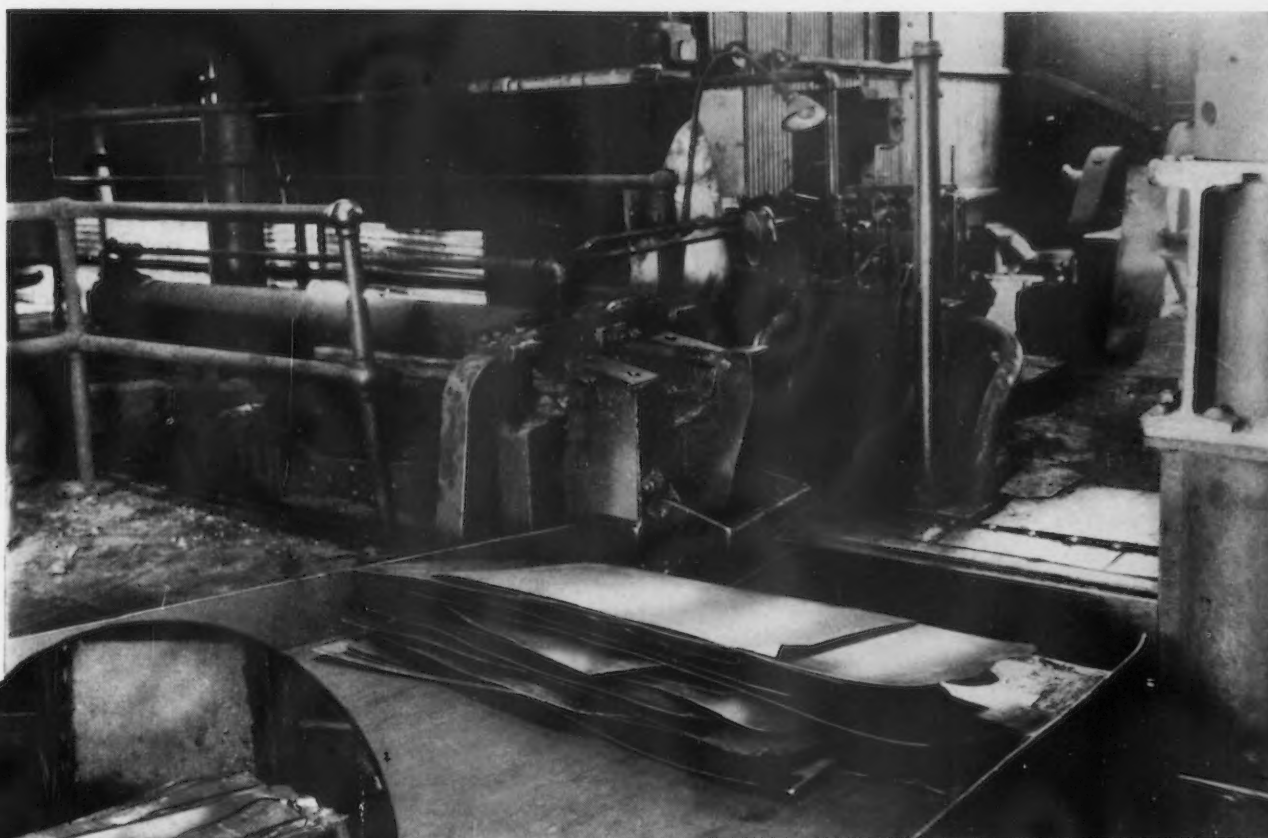
This is the practice at some of our mills, where chopping-up shears are used in connection with the large sheet-size shears. These chop up the side scrap into lengths of about 18 in., and this is tied and deposited neatly in the car. The end scrap, down to a minimum size, is sold for the manufacture of washers, hinges, etc.

In the case of circular sheets being made from squares in some of the heavier gages (where steel drums, drum heads, etc., are produced) the scrap is chopped up very fine and shipped in carload lots, the smallness of the pieces making it easy to take advantage of the minimum carload weight. But for No. 16 to 18 gages and lighter, it is the general practice to bale the scrap with a hydraulic baler, and this baling process will go to even heavier gages whenever it is found economical to do so.

The cost of bundling thin sheet scrap from the hot mills, i.e., scrap that has not been annealed, not including overhead,

Elevator conveying baled scrap to car. The press is at right. A buggy of scrap to be baled is in right foreground, with hopper back of it.





Wide strip of 16-gage steel, before and after baling.

depreciation, interest on investment, etc., but just the actual producing cost, is generally around 50c. a ton. The cost of delivering loose scrap to the press runs from 20c. to 50c. a ton, depending on the system of handling used, and local conditions, such as the location of the press, the location of the railroad loading tracks, availability of overhead cranes, location of shears, and several other factors.

Making Use of Gravity

In handling the loose scrap from the squaring shears to the press, a recent improvement was made at a tin plate mill, cutting down the cost considerably, and the method of handling was as follows:

Formerly it was the custom, as it still is at some mills, to have a man, for every train of rolls, gather the scrap from squaring shears and tie it in a loose bundle. He placed it in a square box or small industrial car, and it then was carried by an overhead crane to the scrap press and dumped on a platform. In some cases a small car was pulled by a storage battery locomotive to the press. But, by turning the shears around at this mill, the boxes were lowered into pits in the floor so that the scrap from the shears drops by gravity directly into the box. As the box is in position to be handled by the overhead crane, the need

for the services of the men tending the shears was eliminated, and a consequent saving made.

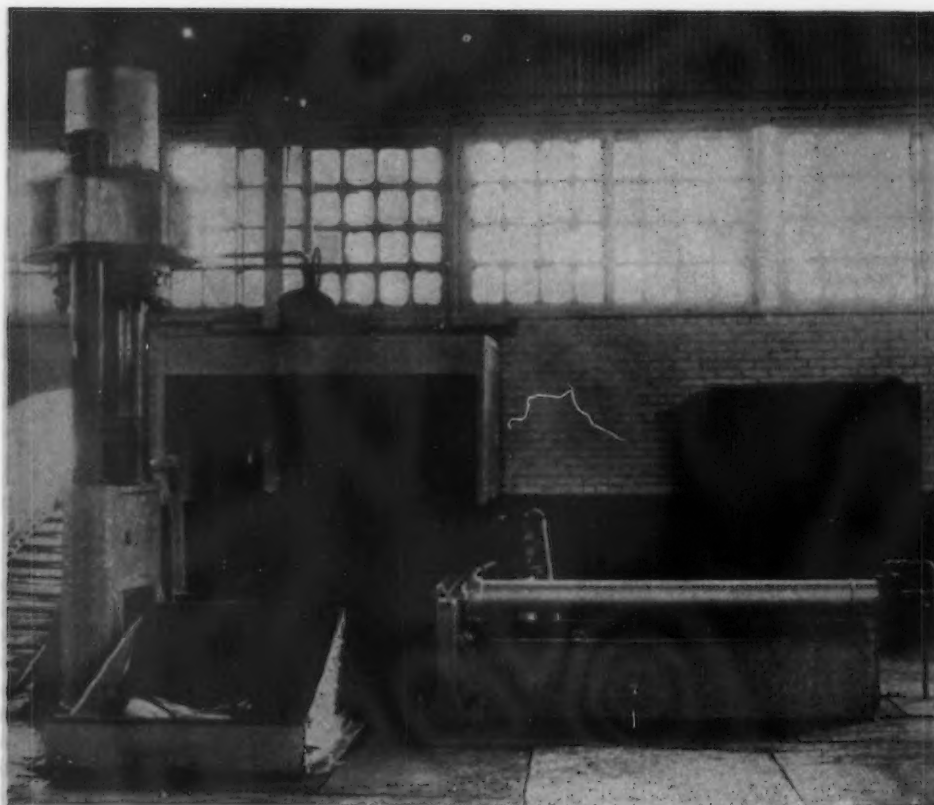
To arrange for the scrap to be deposited in the box in a more orderly condition, so that when it is dumped at the platform of the scrap press it will not be too matted to be handled easily by men with hooks, a counterbalanced pan was installed directly under the shear knife. The purpose of this pan is to allow the scrap to drop parallel to the knife on the pan. When a sufficient bundle of scrap has accumulated on the pan, the pan is counterbalanced and the scrap automatically slides in an orderly manner and is deposited in the container box, still parallel to the shear knife.

Installation of this system showed a saving of over 25c. a ton of scrap handled, compared with the method previously used. Hence the handling of loose scrap to the press at any mill often presents a very interesting materials handling problem, in which quite frequently substantial savings can be made.

Different Kinds of Scrap Introduce Variables

The difference in the kind of scrap to be baled, of course, materially affects the design of the press. In most cases, as mentioned before, the press has to use a higher pressure and be designed more ruggedly for pressing the unannealed hot mill scrap than when used in the plants of manufacturers utilizing finished black or tin plate sheets as raw material. This material is annealed, and is much more easily compressed into a neat bundle of high density.

In pressing cobbled sheets from the tin house, it is necessary, first, to burn off the tin from these sheets as much as possible, and try to redeem as much tin as possible. This not only effects a saving in tin, but



Ram cylinder in right foreground, with filling hopper at left. Above hopper is the high-pressure ram and at extreme left the conveyor carrying bales to outgoing car.

assists the steel maker also, as baled scrap that carries too much tin is very deleterious to open-hearth practice. It is now the custom to dispose of these detinned sheets to buyers who use the scrap in foundries, or in places where the residual tin left on the sheets does not affect the product to be made.

In trimming tin plate sheets to exact size, a large quantity of scrap is made, commonly called "clippings." This scrap when loose can appropriately be called "shredded tin plate." It generally is bundled with a small light press and disposed of to detinning plants. The important part of making these bundles is that the density should not be too great, as it is a detriment to the detinning operation to have too compact a bundle. One of the detinning processes is to place the bundles in tanks and treat them with hydrochloric acid, making tetrachloride of tin. Detinned scrap is then generally rebundled and sold to be made into steel once more.

Capacity of Press and Size of Bale

The size of the bales of scrap will vary according to the open-hearth plant where the scrap is to be used. A common size is 10 in. x 12 in. x 18 in. or longer, depending on the size of the charging boxes at the open-hearth. The density of the bales should run from 0.080 to 0.110 lb. per cu. in., or about one-third that of solid steel. This density, of course, would be higher when annealed scrap is bundled. The pressures used on scrap balers vary from 1500 to 5000 lb., with the range from 1500 to 3000 lb. being most generally used.

The capacity of scrap presses in sheet and tin

mills varies from 4 to 10½ tons of pressed scrap an hour, depending a great deal on the number of pumps used. Generally, no hydraulic accumulators are used in presses in mills, as their use has not been found justifiable.

The fundamental parts of the scrap press as now developed are as follows:

The box is equipped with renewable liner plates and air-actuated cover. The liner plates are sometimes corrugated, or may be finished plain. The idea of corrugations is to have the sides of the head on the plunger corrugated also, and to fit into the corrugations on the liner plates of the box. This will sometimes prevent pieces of scrap from wedging in between the plunger head and the box, having this advantage over a smooth liner plate, but having the disadvantage of making it much more difficult

to remove pieces of scrap once they are caught in between the head of the plunger and the box. Both kinds are used in our mills. The liner plates are generally made from high-carbon, high-manganese steel, to resist wear. The heads of both the high and low-pressure rams are renewable also, as wear occurs at these points. The air-actuated cover generally travels on rollers, with a wedge lock.

The cover is sometimes run underneath a ledge on the box, locking it to the top, or it may be equipped with an overhead yoke. Either kind is satisfactory, but the ledge gives a freer opening to the box for charging.

Details of the Press and Its Control

The horizontal cylinder is called the low-pressure cylinder, or ram, as it travels a certain defined distance and moves the scrap up until it comes to a stop. This ram is receded after the bundle is made, by means of counterweights, and considerable time is gained in the back travel of this ram by having a large air-operated or solenoid-operated discharge valve, which permits the hydraulic medium to return directly to the supply tank through a large pipe, without going back through the operating valves or pump. This makes the counterweights much more effective in returning the low-pressure ram after a bundle has been made.

The packing glands of both the high and low-pressure rams are made of heavy steel forgings, bronze bushed, and the packing used is generally several 1-in. square flax rings, with outside and inside rings generally of composition. Packing similar to

this, properly installed, has given two years' service.

The high-pressure ram, which is operated in a vertical direction, compresses the bundle up to the capacity of the pump, or until the relief valve trips. Then, after the pressure is eased off, and the low-pressure ram recedes, the air-actuated cover is returned and the high-pressure ram moved up to the top of the press box. The bundle is then ejected from the press by means of a ram on the air-actuated cover.

One of the newest developments in the design of hydraulic scrap presses is to have the vertical high-pressure cylinder work up above the press rather than down below. This has the advantage that no deep pit is required for a foundation, working parts of the high-pressure cylinder are open for inspection constantly, and the high-pressure ram is not bothered with pieces of scrap falling on it and catching between the ram and the packing glands. In the style of press where the high-pressure ram is below the level of the press, ingenious arrangements have been made to protect the high-pressure ram from small pieces of scrap getting into the working parts of the press.

The hydraulic pumps commonly used on the larger and stronger presses generally work through a set of valves up to a certain pressure. Then, when higher pressures are desired, an automatic lever trips on the side and brings in the second set of valves. These pumps are generally triplex horizontal pumps. The hydraulic medium used in our scrap balers is a mixture of soluble oil and water. We have found that it is more economical to use this medium, even though it is necessary to provide means to prevent it from freezing in the winter time.

Operating Valves

The operating valves are, of course, a very important accessory of the press, and great improvements have been made in these valves in recent years. The latest valves are air-actuated and are operated by means of pilot valves, making them much more efficient and easier for the operator to manipulate.

In addition, there are a storage tank for the hydraulic medium, and a surge relief element. This surge relief element is generally a spring-operated relief valve, to take any acute hydraulic hammer on the press.

Two additional auxiliaries are an indicating pressure gage, which at all times should be kept in good condition, as it is an exact indication of how the press is working, and an automatic relief valve set to the pressure required to make the type of bundle desired.

There are several means of facilitating the load-

ing of the press box with scrap to be bundled. The most common is to use long scrap hooks with two or three prongs. The men, using these, rake the scrap from a convenient pile directly into the box. If the scrap is distributed into the box in a more or less matted condition, it will interlock and form a tighter bundle—that is, a bundle that will stand more shock in handling without tending to come apart.

Another means of feeding the press box is to have an air-actuated dumping box into which the scrap is raked by men with hooks. When a charge sufficient for a bundle is raked in, one end of the box is raised to a vertical position and the scrap slides into the press box. This arrangement is supposed to save time, as the auxiliary air dump box can be loaded while the press is making a bundle. Then, as soon as the bundle is ejected from the press and the low-pressure ram has receded, a new charge of scrap can be immediately dumped.

Another method of loading the press box is by means of magnets on an electrically operated jib crane. These magnets are generally used where the scrap is deposited at the press in a more or less matted condition, making it difficult to handle with hand labor and hooks. It is sometimes advisable, when a magnet is used, to have a vertical overhead tamping hammer, air operated, to assist in tamping the charge in the press box after the magnet has deposited its load.

At some plants the scrap is brought to the press, as mentioned before, in industrial cars, a sufficient charge in each car for one bundle. These cars are mounted on trunnions and are picked off the trucks with a jib crane and set on tilting trunnions alongside the press box. Thus the cars may be tilted and the scrap dumped directly into the press box without further handling. This system is employed in manufacturing plants using annealed sheets. Here the press box is able to take a large quantity of scrap material, on account of the great density of the annealed scrap bundled.

Loading the press box by air-operated dump tray, previously filled. A bale appears beyond the box, on its way out.



Conveyor Systems Effectively Decorate a Modern Office

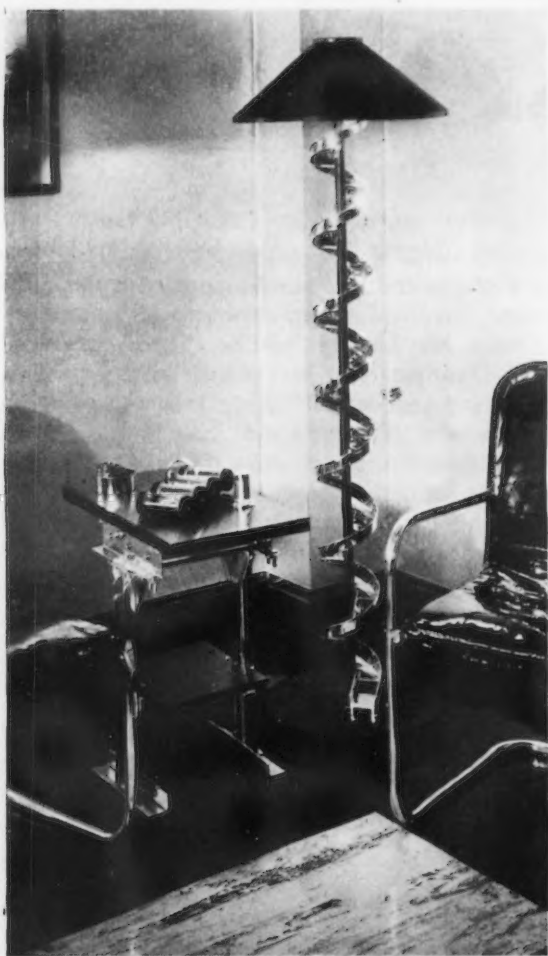
MODERNISM, combining attractiveness with utility, is the keynote of decoration in an exhibition room on the forty-fourth floor of the Chrysler Building in New York. The interior is the conception of C. K. Pevear, New York manager of the Lamson Co., Syracuse, N. Y., manufacturer of conveying systems, and is intended

to provide a complete descriptive display of the company's products, without giving the appearance of a commonplace exhibition.

The large table in the center is supported on six legs composed of chromium-plated steel channels, the standard supports for the conveyors made by the company. It has a Bakelite top in four sections, which, when rolled back on bearings disclose five different sizes and types of rolls used in conveyor installations. The older type of cut-off rolls are shown, as well as a new type with a swaged end. The rolls are mounted in the frame of the table as in a conveyor, certain rolls having oilless bearings, others having grease cups and some being of the through shaft type.

A small table, also provided with a removable Bakelite top, shows a recently developed spring-shaft roller, which may be easily taken out of a conveyor by pressing the end. Floor lamps, which are purely modernistic in treatment, have the additional feature of being working models of the company's standard spiral conveyors, one having a gravity roller spiral, another a rod spiral and a third a sheet metal spiral conveyor reaching from a large gear, forming the base, up to the light socket. The shades are of steel,

(Concluded on page 1224)



THE modern movement in decoration has sought to interpret the new industrial era by symbolizing engineering achievement and using metals to gain effects. In its New York office in the Chrysler Building, the Lamson Co. has applied its products in their original form to the construction of furnishings and decorations, serving the dual purpose of office equipment and a permanent exhibit of its conveying systems.



ONE WORD COSTS BILLIONS

OVERPRODUCTION—the most widely advertised word in the world today! The theme song of economics, business and industry. A popular slogan for politicians, philosophers and panhandlers. A word that through repetition has become a Nemesis, paralyzing initiative, sapping courage for enterprise, destroying perspective and befuddling judgment.

How strange that Americans, who refuse to bow the knee to kings, should prostrate themselves in submission before the power of a mere word!

Strange, indeed, that a mere word, puffed up by publicity into a national bogeyman, should threaten to turn us against machinery—that wealth-bestowing friend and ally that has made America the richest country in the world.

"But," you say, "intelligent men who know industry still believe in improved machinery. They are not turning their backs upon it."

Unfortunately, they are. They may not be aware of it; they may profess the old faith in words, but in actions they are repudiating it.

If this were not so, the makers of improved machinery and equipment would be doing a bigger business in America today than they have ever done. Why? To increase production? *No*. To reduce costs? *Yes*. For in cost reduction lies the one way out of the present dilemma.

Improved machinery is the one means of securing larger profits from a smaller volume of business. It is the one means of obtaining the price reductions in product that are demanded by curtailed purchasing power. It is the one way to practice the economy demanded by the times by transforming wastes into profits.

Are better tools and equipment available today? Undoubtedly. During the past year, more improvements in equipment and cost-saving tools have been made than in any previous two-year period. The tool and equipment industry has sensed and anticipated our national need for cost reduction.

But industry has failed, as yet, to properly grasp these means, and thereby pull itself and the rest of us out of the slough of despond. The hypnotizing power of that deadly word "overproduction" is responsible.

It has distorted the vision of boards of directors and of bankers whose function it is to approve and provide the funds for new equipment.

In the desire to prevent increases in plant capacity, thumbs are being turned down on replacements which would return from 50 to 100 per cent in a year's time in cost reduction dividends.

Expenditures such as these, made for cost-reducing and time-saving equipment, are in an entirely different class from those made for expansion of volume. The latter encourage overproduction; the former cure its evils.

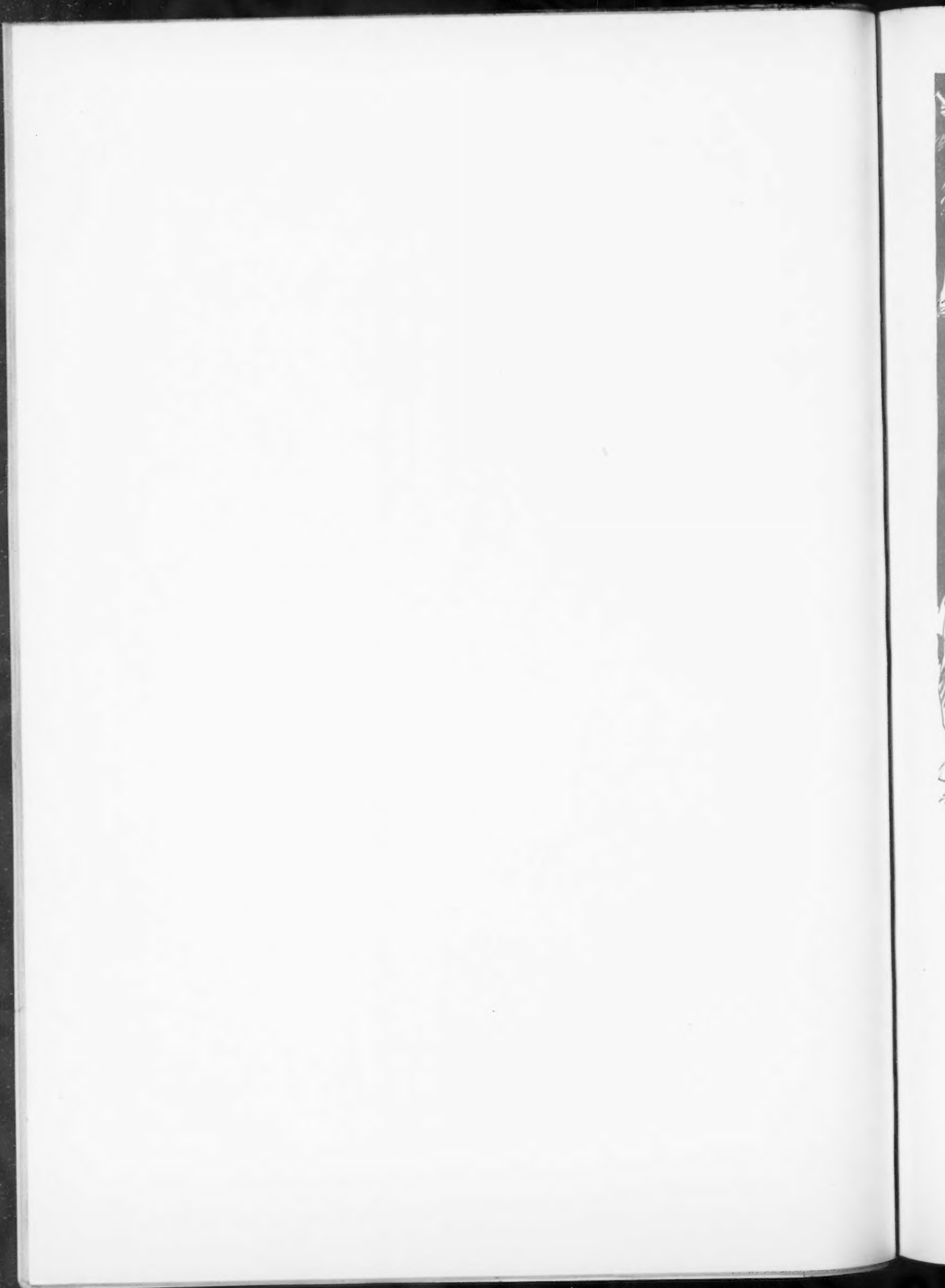
Plant expansion has for its purpose the increase of dollar volume. It is always a speculation, especially so at present. But cost reduction is always a sound investment, secured by the certainty that a less number of dollars will be made to earn more profits.

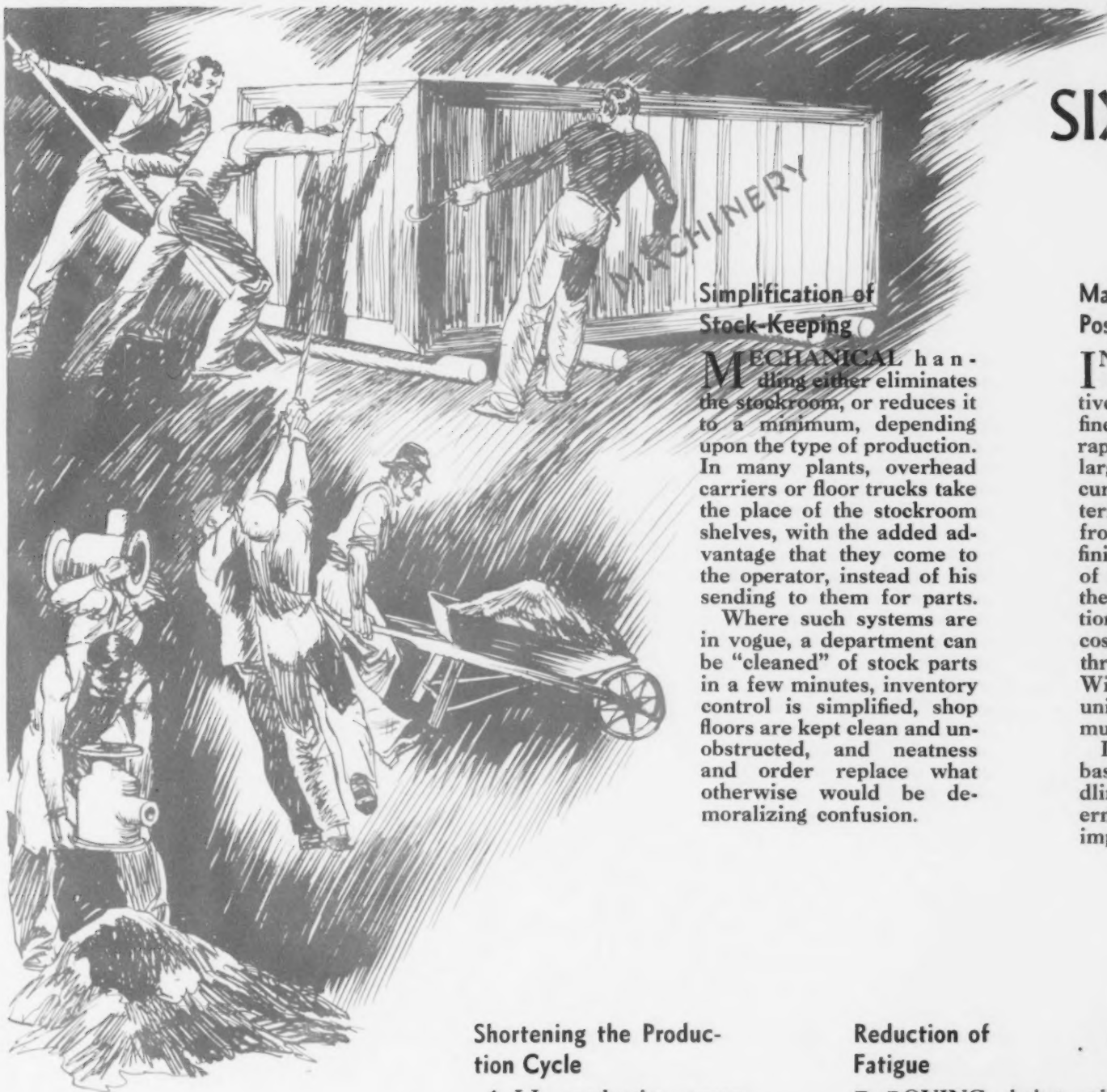
By
JOHN H. VAN DEVENTER

Industrial Consultant
The Iron Age

*Copies of this editorial may be secured from the Reader Service
Dept. of The Iron Age, 239 West Thirty-ninth Street, New York.*

The Iron Age, April 9, 1931—1165





Simplification of Stock-Keeping

MECHANICAL handling either eliminates the stockroom, or reduces it to a minimum, depending upon the type of production. In many plants, overhead carriers or floor trucks take the place of the stockroom shelves, with the added advantage that they come to the operator, instead of his sending to them for parts.

Where such systems are in vogue, a department can be "cleaned" of stock parts in a few minutes, inventory control is simplified, shop floors are kept clean and unobstructed, and neatness and order replace what otherwise would be demoralizing confusion.

Makes Integration Possible

INTEGRATED production, of which the automotive industry presents the finest example, is being rapidly extended to other large volume lines. By securing a steady flow of materials and product parts from raw materials to the finished product, this system of manufacture represents the most advanced production practice. With it, lower costs can be secured than through any other method. With it, too, overhead per unit is reduced to a minimum.

Integrated production is based on mechanical handling. Without it, this modern development would be impossible.

Reduction of Stock in Process

IDLE stock means idle dollars. One of the most effective profit-making contributions to industry has been the reduction in stock in process secured through mechanical handling. This applies not merely to "mass production" products but to those made in small lots as well.

By making product parts quickly available when wanted, mechanical handling has cut inventories to the bone, thus reducing to a minimum the interest charges on work in process.

Shortening the Production Cycle

ALL production executives know that lost time in a process of making a product accumulates between, rather than at, the operations. The modern theory in profit-making production is to eliminate the "rest periods" in which a product part merely "loafs" in idleness and to keep it in action as continuously as possible from start to finish. The length of the production cycle, measured in days or hours, is the sum of the resting and working periods of the parts. Mechanical handling, by cutting the rest periods to a minimum has produced remarkable results in shortening production cycles.

Reduction of Fatigue

MOVING being the greater part of making, it is obvious that, when mechanical handling is substituted for physical lifting and carrying, there must be a large reduction in fatigue. Also that this lessening of the physical strain provides energy that may be used in more profitable directions. This applies not merely to the handling involved in actual transportation, but even more forcefully to that which often falls to the lot of the skilled operator. By saving footsteps as well as backaches for this class of labor fatigue reduction becomes a factor in reducing labor costs.

Cutting Transport Cost

THIS is the most important of the savings by mechanical handling applies not only to handling of raw materials but throughout all movements of every manufacturing plant. Moving the greater part of materials in industry today. Productive labor is largely a matter of horizontal and vertical movement of materials. By substituting efficient mechanical means for now done through excessive physical effort, productive labor is greatly reduced.

SEVEN AVENUES TO COST REDUCTION THROUGH MECHANICAL HANDLING

By John H. Van Deventer

Industrial Consultant—The Iron Age

Automation

MECHANICAL HANDLING represents the most efficient method of producing product parts. By securing a steady flow of materials to the production line, this system represents a saving in cost. With it, lower overhead per unit is secured than by any other method.

production is mechanical handling, this method would be

Coordination of Operations

IDLE time, when there is no work to be done, is one of the chief causes of waste, high cost and diminished profits. The principal cause of idle time among both machine and hand operators is irregularity in the supply of materials. This results in poor coordination of operations.

It is no longer necessary to countenance such losses, since standard types of mechanical handling equipment can be obtained designed to suit any condition of product design or quantity. Through these, coordination of operations is obtained and idle time eliminated from the standpoint of supply.

Aid to Production Control

THE systematizing of transportation through mechanical handling is effective in simplifying production control. This factor applies to mass production and non-mass-production operations. In the former, where continuous production is applied, the handling system becomes, in itself, the major means of production control. In the non-mass-production operations, it becomes first aid to the routing and dispatching system. It eliminates the stock chaser and the roustabout, taking upon its mechanical shoulders many of the former worries of the production chief.

Automatic Pace-Making

THE stimulation of effort resulting from a smooth and steady flow of work is a large factor in the lessening of labor costs. Mechanical handling compels teamwork because of its pacemaking effect. This, with process coordination as a companion factor, has been the reason for the surprising increase in output per man in all cases where it is possible to arrange for continuous production. Both machine and assembly operations lend themselves to the pacemaking effect, which also is applied with good results in foundry and hot metal operations.

Cutting Transportation Cost

THIS is the most obvious but not the most important of the savings made by mechanical handling. It applies not only to the bulk handling of raw materials, but throughout all departments of every manufacturing plant. Moving is the greater part of making in industry today. Non-productive labor is very largely a matter of the horizontal and vertical movement of materials and parts. By substituting efficient mechanical means for what is now done through ineffective physical effort, non-productive labor costs are greatly reduced.

Expediting Process Reorganization

THE progressive factory manager recognizes industrial production processes as being in a constant state of evolution. It is his purpose continually to eliminate wastes and increase efficiency. The latter is simple after the wastes and inefficiencies are discovered.

Mechanical handling has done more than to increase the efficiency of the part of the job to which it has been applied. Almost invariably it brings to light wastes theretofore undiscovered, by introducing the element of competition between operations.

Quickening the Inventory Turnover

PROFITS nowadays must come from rapid turnover. With today's keen competition there is not much chance to look for them elsewhere. Therefore the object of the management that is on its toes is to compel the invested dollar to make more round trips per year.

Turnover of both inventory and invested capital is quickened by mechanical handling, because of the reduction of stock in process and the shortening of the production cycle.

Mechanization of Hand Operations

HAND operations, including assembly, have been less efficient than the usual production process than have been machine operations. Men work in groups on assembly operations, a difficult control problem. The problem is solved, however, when it is possible to group assembly operations along the conveyor. This introduces automatic timing which mechanizes hand operations in principle, produces a large increase in the overall efficiency.

THROUGH MECHANICAL HANDLING

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Conservation of Floor Space

THROUGH the use of mechanical handling, and the regrouping and concentration of machines which this use permits, production floor space for a given output is often cut in half. A similar or even greater space saving is made through the reduction of work in process, and because mechanical handling enables the utilization of unused overhead space for storage or transportation. This means a decrease in the investment required in new plants and a substantial saving in the operation of old ones because of the reduction of lighting, heating and other charges.

Increasing the Manufacturing Unit

IT is an accepted fact that there is a distinct relation between the size of the manufacturing or production unit and the cost of the product. In modern manufacturing, except for very small product parts, it is impossible to attain an economical production unit without the aid of mechanical handling. This applies to bulk materials as well as product parts handled singly or collectively.

Mechanical handling, through floor, table high or overhead handling devices, removes the limit from the production unit, placing the choice of its size at the best judgment of management.

Mechanization of Time-Keeping

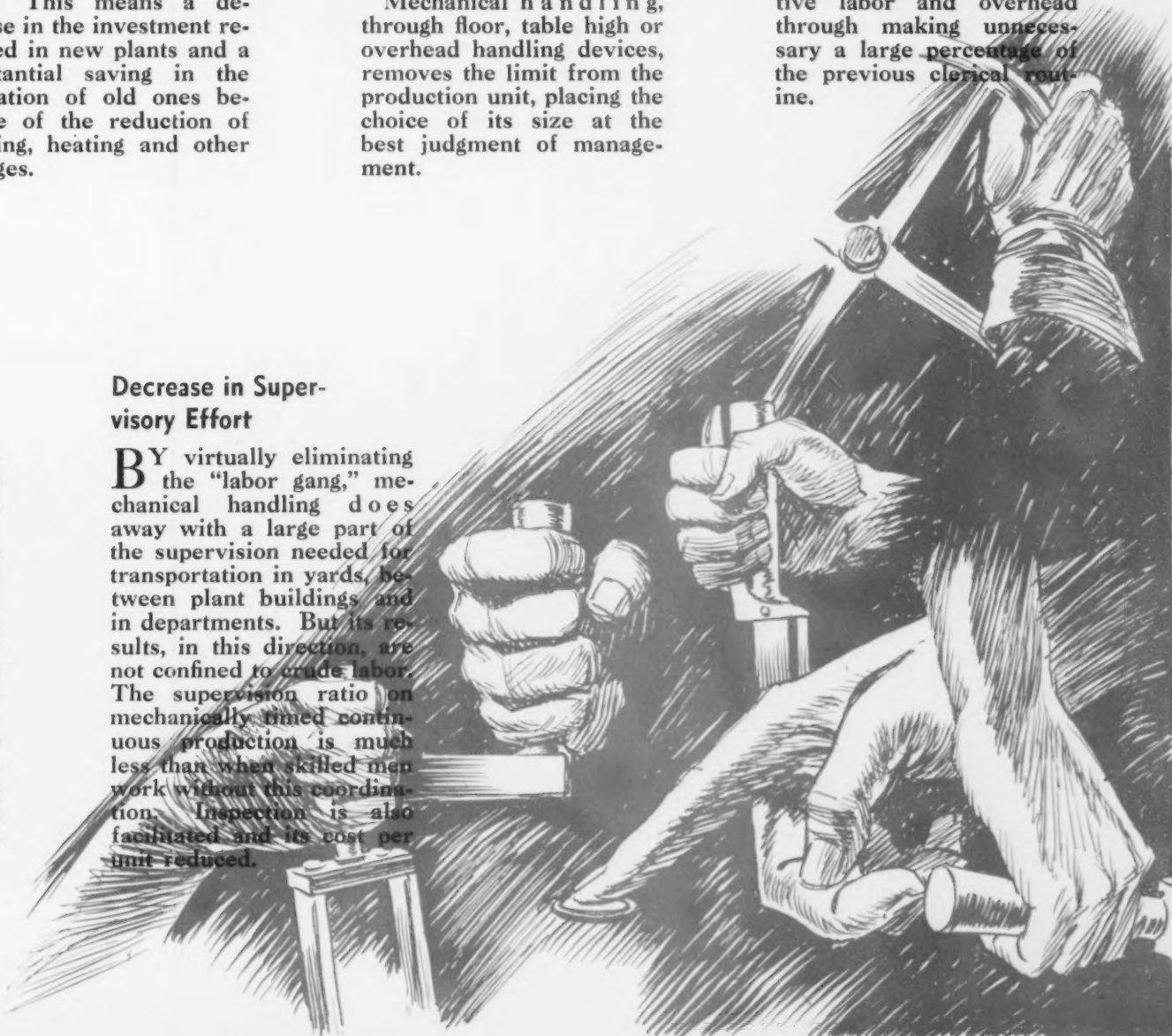
PROCESS coordination secured by mechanical handling in production, together with the feature of automatic pace-making, reduces the ratio of time-keepers and cost clerks per 100 men employed. For with mechanical handling of production, completion time is known in advance, and costs become largely repetition. Here again, mechanical handling shows its ability to reduce non-productive labor and overhead through making unnecessary a large percentage of the previous clerical routine.

Mechanization of Operations

AND operations, including assembly, have less efficient parts of mechanical production process have been machine operations. Men working in production assembly present a control problem. This problem is largely solved, however, when it is possible to group assemblies along a continuous line. This introduces the automatic timing feature which mechanizes hand operations in principle, and results in a large increase in overall efficiency.

Decrease in Supervisory Effort

BY virtually eliminating the "labor gang," mechanical handling does away with a large part of the supervision needed for transportation in yards, between plant buildings and in departments. But its results, in this direction, are not confined to crude labor. The supervision ratio on mechanically timed continuous production is much less than when skilled men work without this coordination. Inspection is also facilitated and its cost per unit reduced.



The Iron Age, April 9th, 1931





PICTORIAL PRESENTATION OF MECHANICAL HANDLING IDEAS

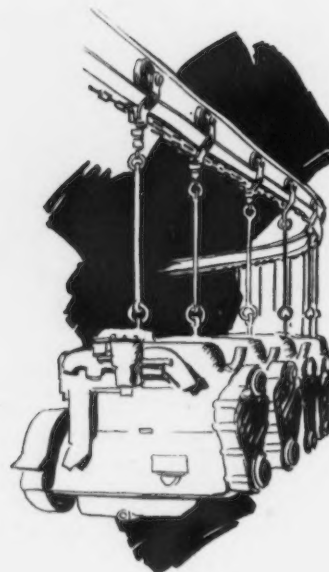
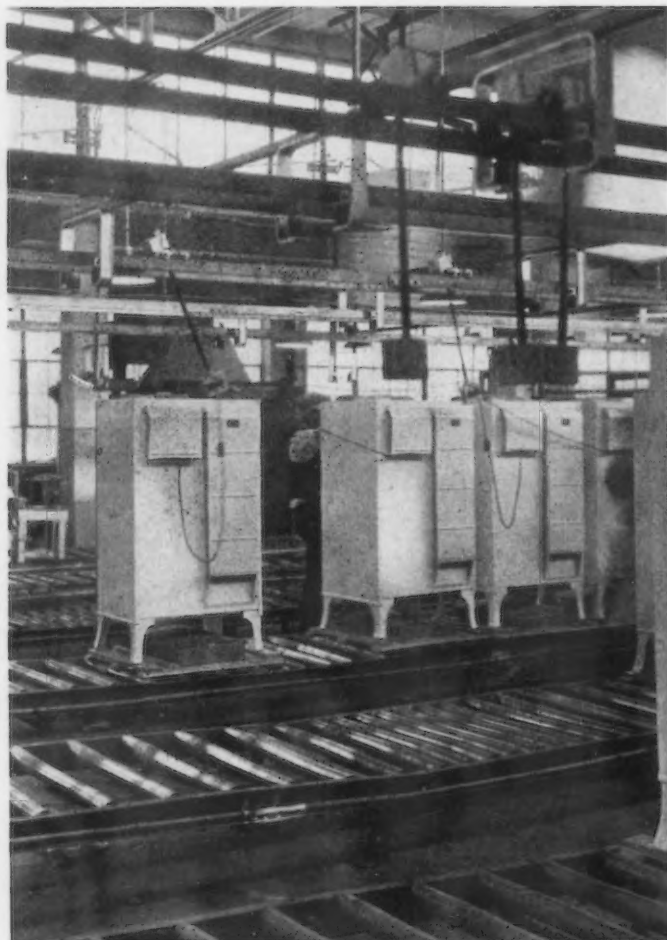
ON the following pages, The Iron Age presents to its readers, pictorially, a broad survey of modern handling ideas. These are drawn from many branches of the metal-working industry and show a wide variety of types of handling equipment actually at work on the job.

The purpose and method, in each case, are so clearly evident from the illustrations that very little text is necessary to describe them.

The reader who peruses this section is taken into many plants and shown the work of many minds. Undoubtedly, he will be able to transpose some of these ideas profitably into his own business.



AMONG THE PRODUCTION CO

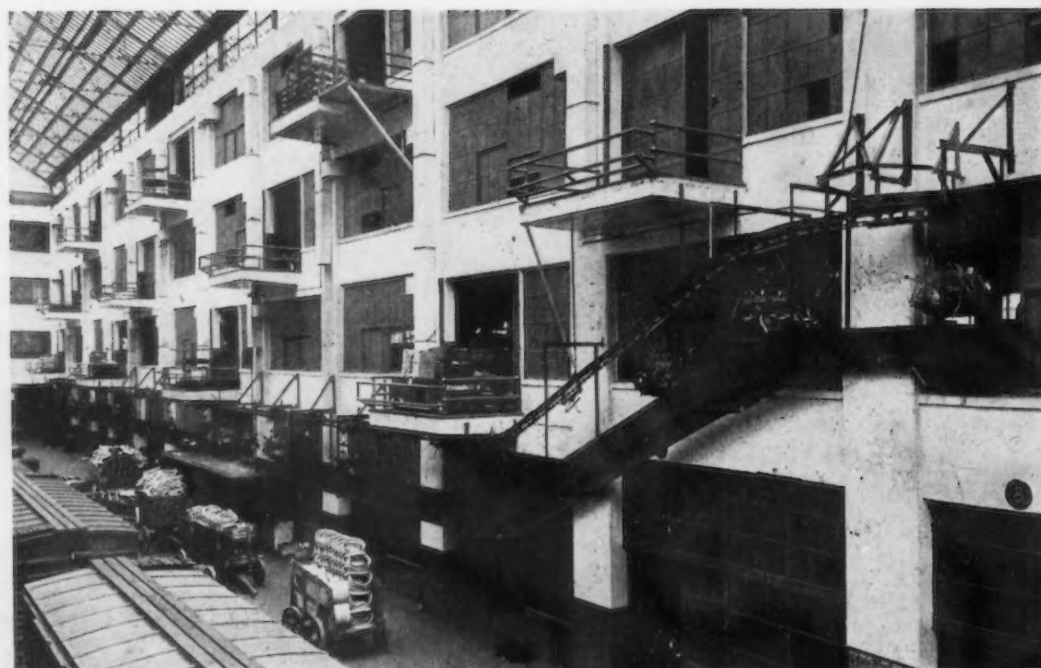


THE electric refrigerator industry has adopted mass production. In doing this it turned to mechanical handling as first aid to smooth transportation. Note these Majestic refrigerators en route through inspection.

Courtesy, Webster & Weller Mfg. Co., Chicago.

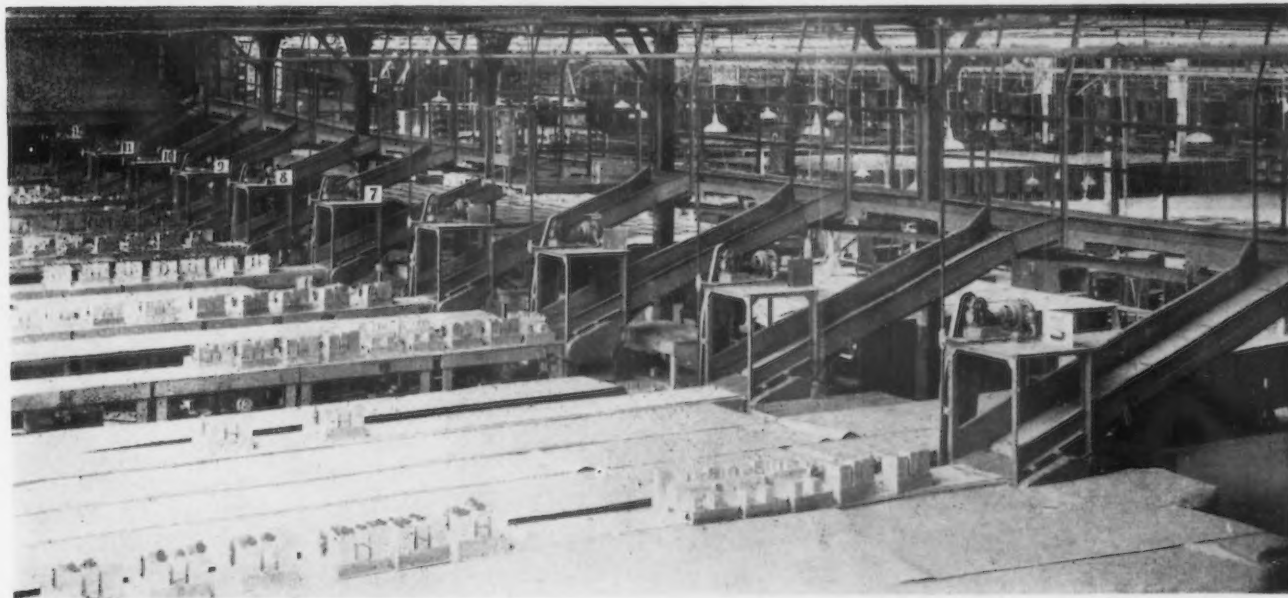
AT the Studebaker plant, a continuous stream of motors is transported via overhead conveyor from motor department to assembly. The floors and aisles are left clear for other traffic.

Courtesy, Jervis B. Webb Co., Detroit.



ORDINATORS

MOVING IS A PART OF MAKING, AND MODERN PRODUCTION MOVING IS MECHANIZED.

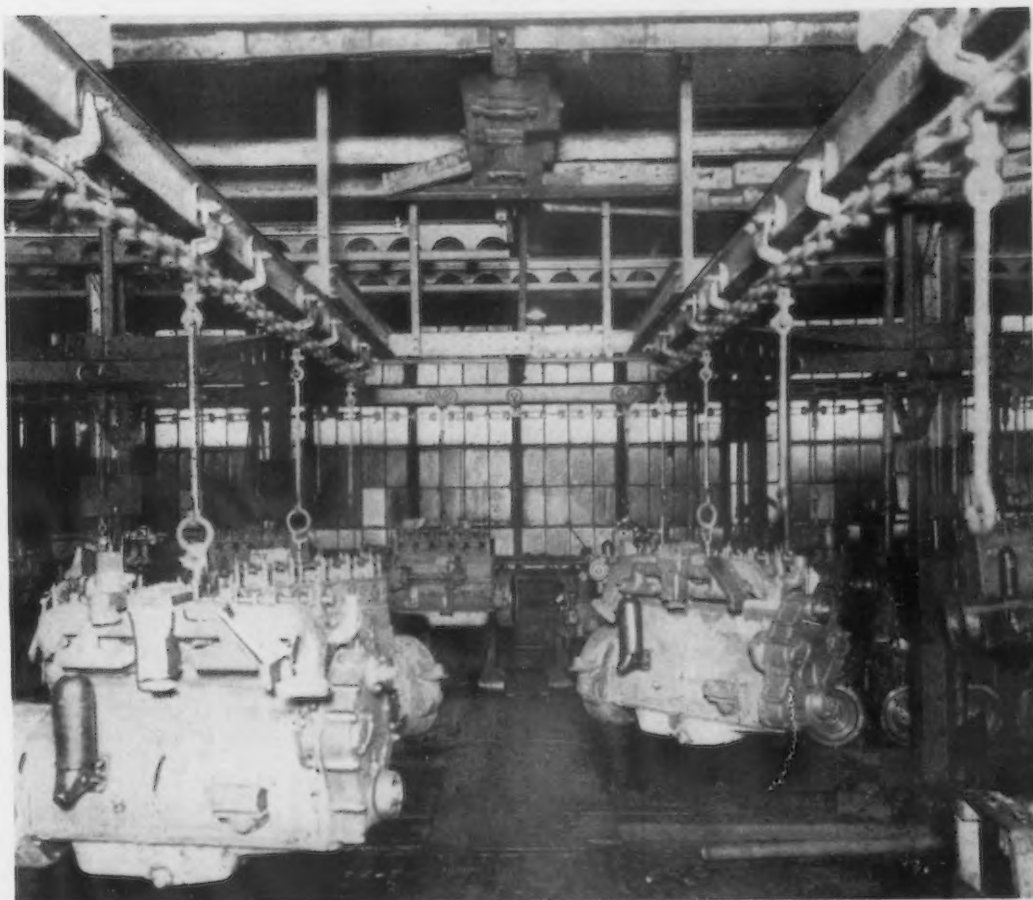


AUTOMATIC three dimensional flow of product parts is an essential to modern integrated production. Note how this is obtained by belt conveyors by the Grigsby-Grunow Co., in handling radio chassis.

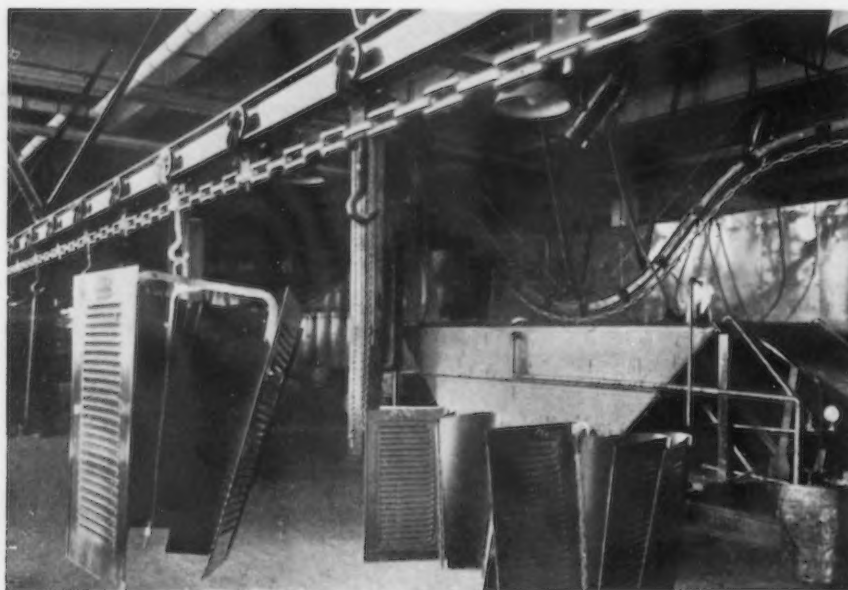
Courtesy, Webster & Weller Mfg. Co., Chicago

THESE 1500-lb. Continental bus motors are husky jobs to handle through production. The overhead conveyor which carries them through the plant has no light task on its hands. Rugged design, however, fits it for the load.

Courtesy, Webster & Weller Mfg. Co., Chicago



AMONG THE PRODUCTION CO



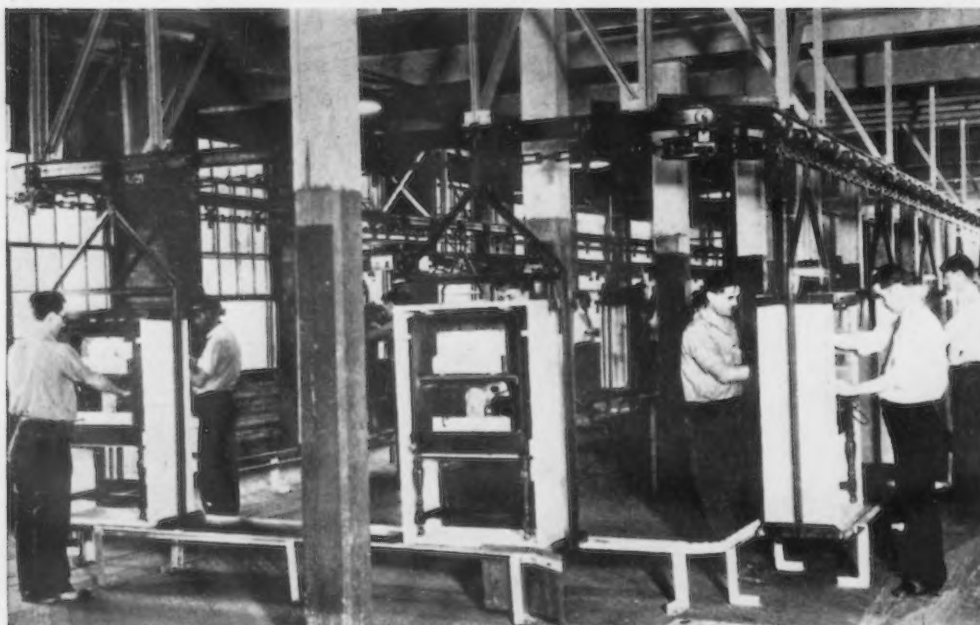
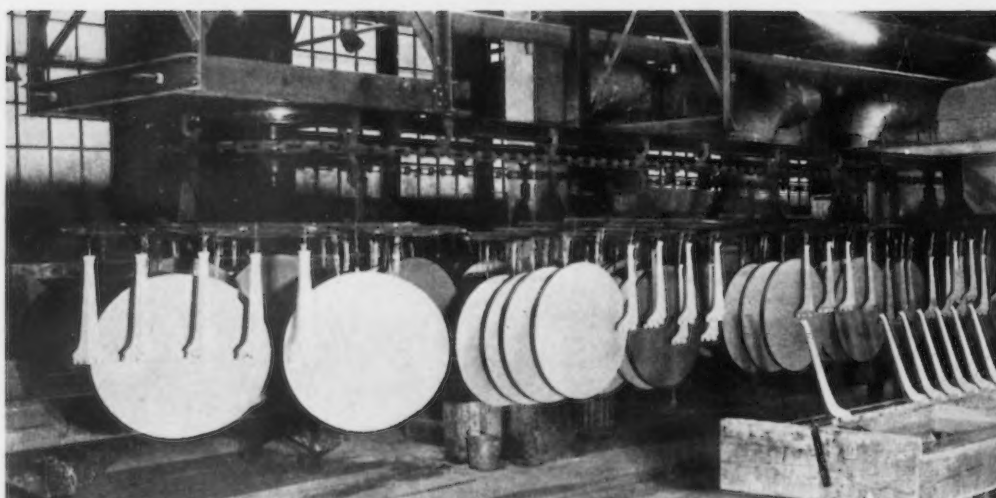
THIS monorail conveyor handles automobile hoods through the painting operation. Note the dip in the track in the background. This automatically lowers the hoods into the tank containing the priming paint.

Courtesy, Mechanical Handling Systems, Inc., Detroit.



▲ ▲ ▲
BY adopting conveyor handling in its production, the Ingram - Richardson Co., manufacturer of street signs and other sheet metal parts, stepped up the production volume 50 per cent or more on this 30-in. disk.

Courtesy, Mathews Conveyor Co., Ellwood City, Pa.

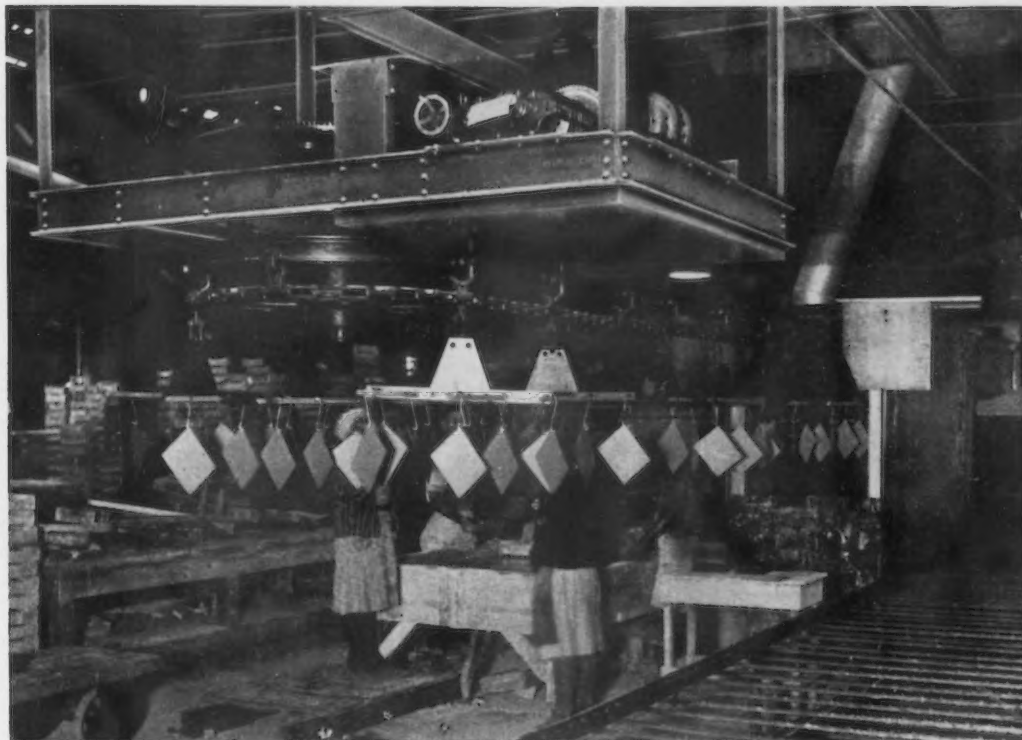
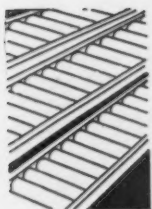


▲ ▲ ▲
ASSEMBLY on an overhead conveyor. Radio cabinets being assembled with chassis and tested while on the move, and then transported to storage or to shipping dock without re-handling.

Courtesy, Jervis B. Webb Co., Detroit.



ORDINATORS (Continued)



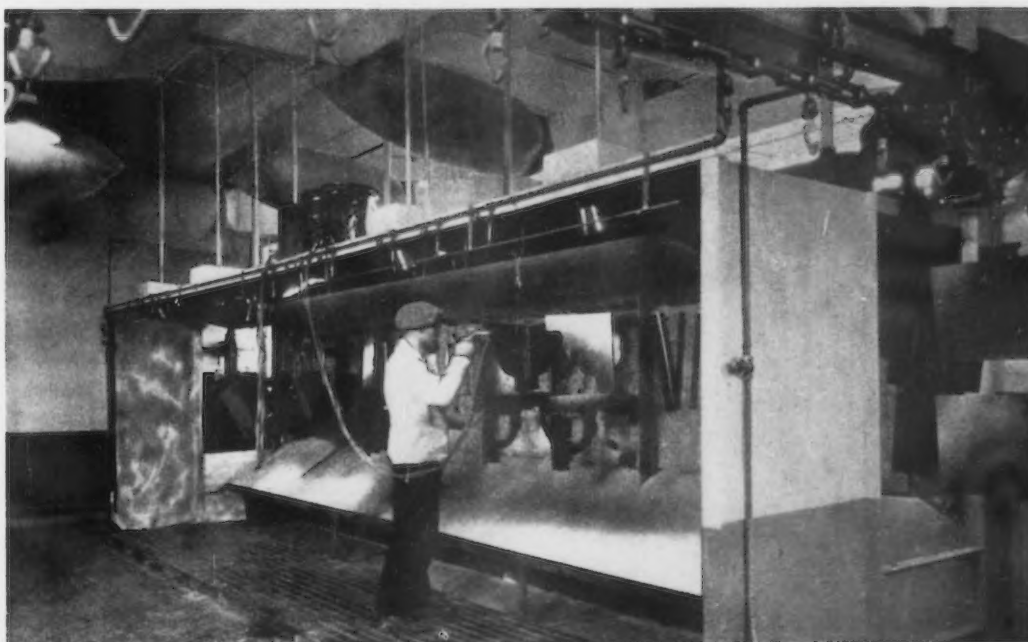
MECCHANICAL transportation in production is well represented here. Note the coordination of handling effort in this section of a metal sign company. Minutes count in a competitive industry.

Courtesy, Mathews Conveyor Co., Ellwood City, Pa.

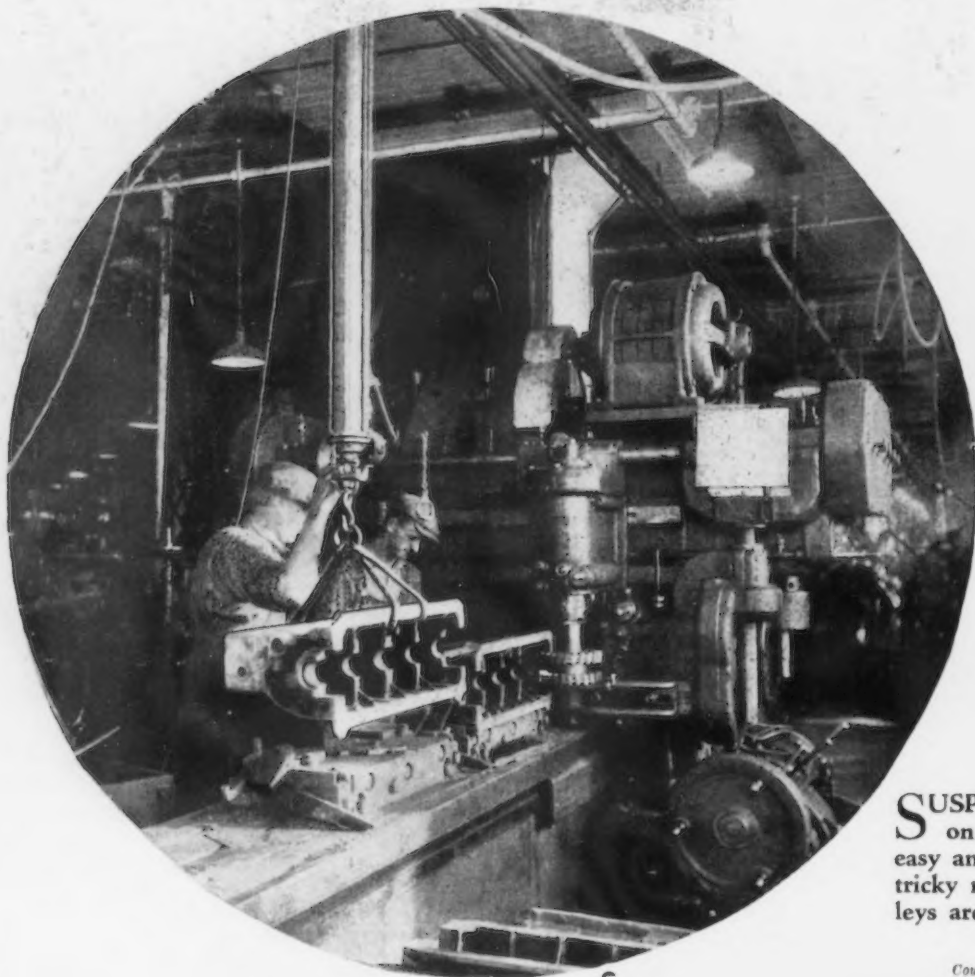


SPRAY painting on an overhead conveyor. This installation shows cash register parts being sprayed en route. Parts of all sorts from automobile bodies to small stampings are successfully handled by similar methods.

Courtesy, Jervis B. Webb Co., Detroit.



"INDOOR SPORTS", ONE MAY



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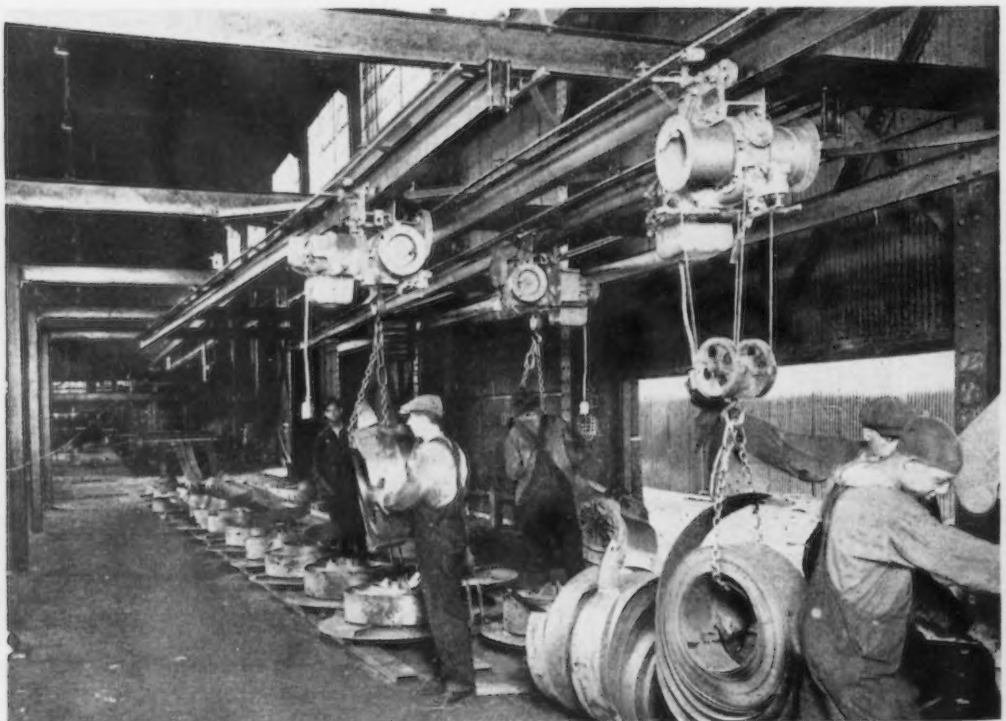
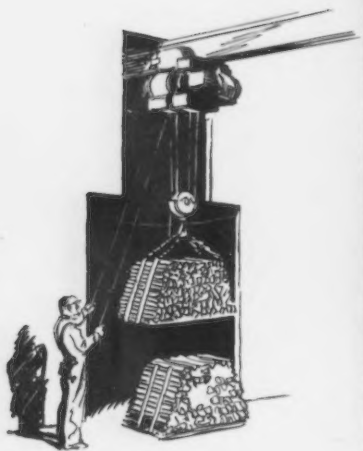
SKILLED machine operators are paid for head work, not arm work. Non-productive time of such men is reduced by facilities for quick machine loading, especially of the heavier classes of castings. This air hoist is a side partner of the tool it serves.

Courtesy, Hanna Engineering Works, Chicago.

▼ ▼ ▼

SUSPENDED pushbutton control on these electric hoists makes an easy and safe job of handling this tricky material. Plain I-beam trolleys are used in this installation at the Acme Steel Co.

Courtesy, Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y.



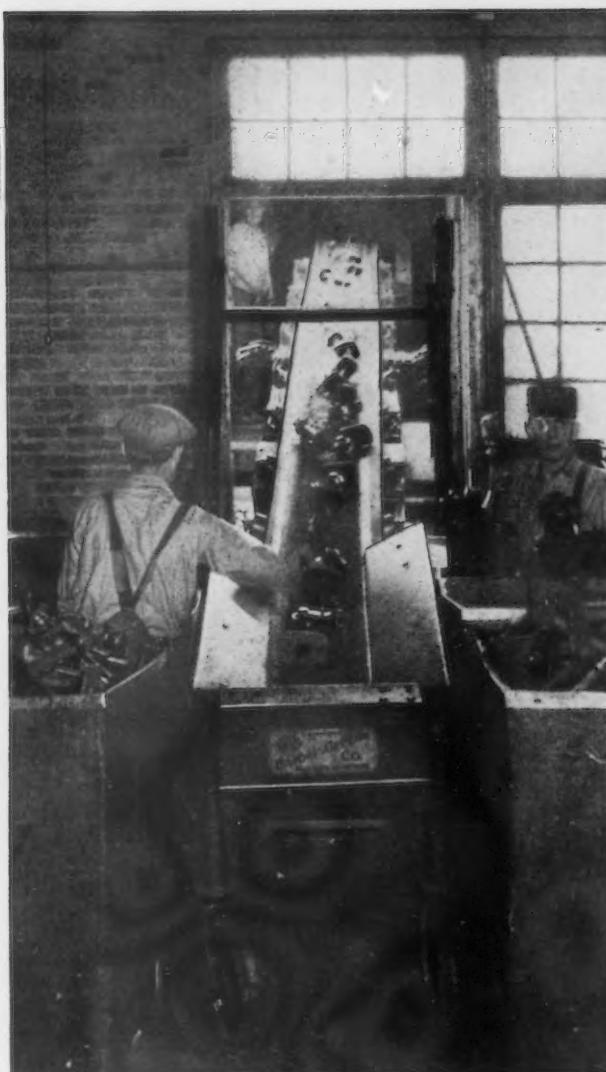
CALL THEM

AND THESE HANDLING MECHANISMS, LIKE ALL GOOD SPORTS, CARRY THEIR FULL SHARE OF THE LOAD.



UP go the jacks, through the window and into the box car, via this portable belt conveyor at the Auto Specialties Mfg. Co. plant at Jackson, Mich. Result: loading time halved and loading gang reduced one-third.

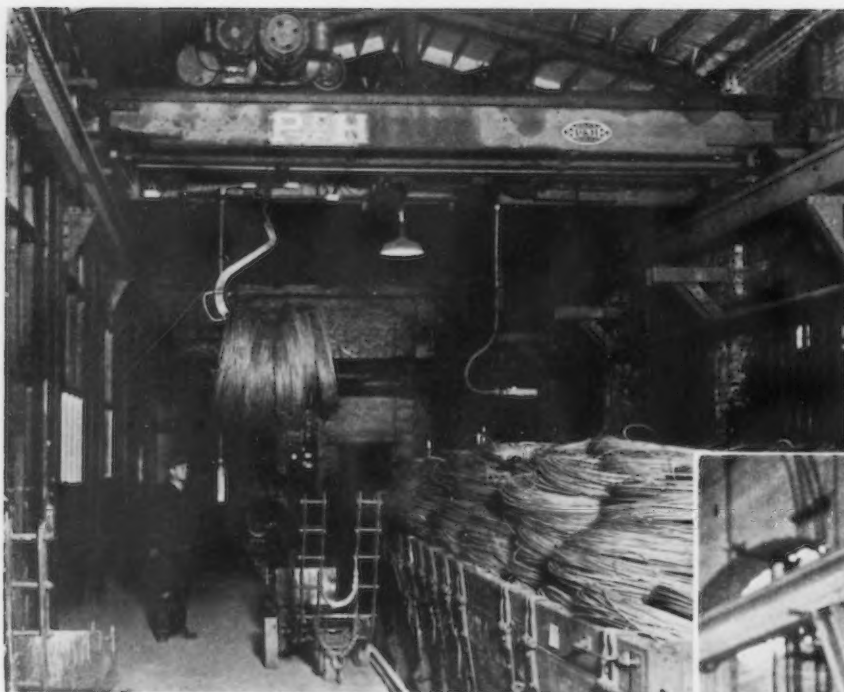
Courtesy, Barber-Greene Co., Aurora, Ill.



ONE man and several handling helpers at work in this stockroom. The helpers are the four-wheeled trucks, which simplify the handling of pistons throughout this plant.

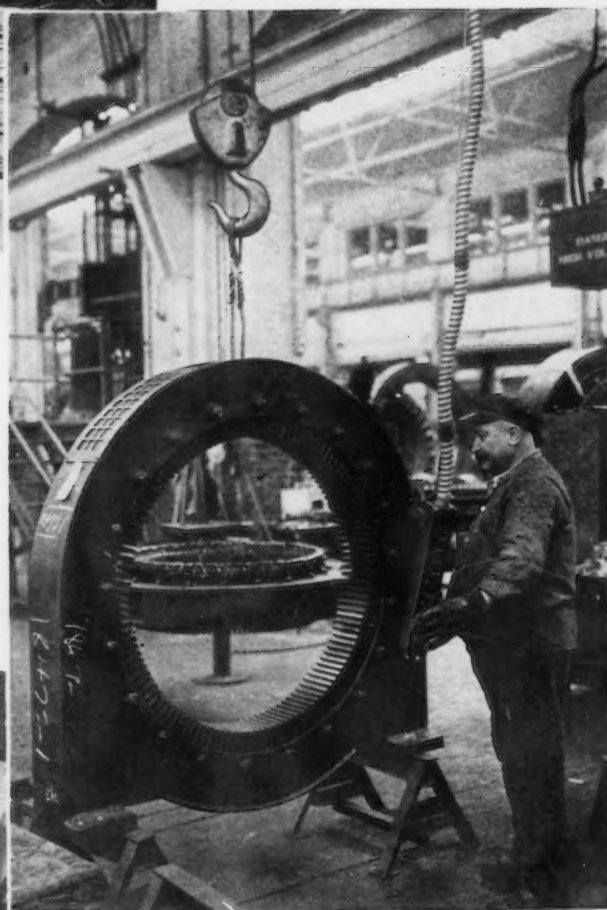
Courtesy, Coleco Co., Elyria, Ohio

"INDOOR SPORTS", ONE MAY



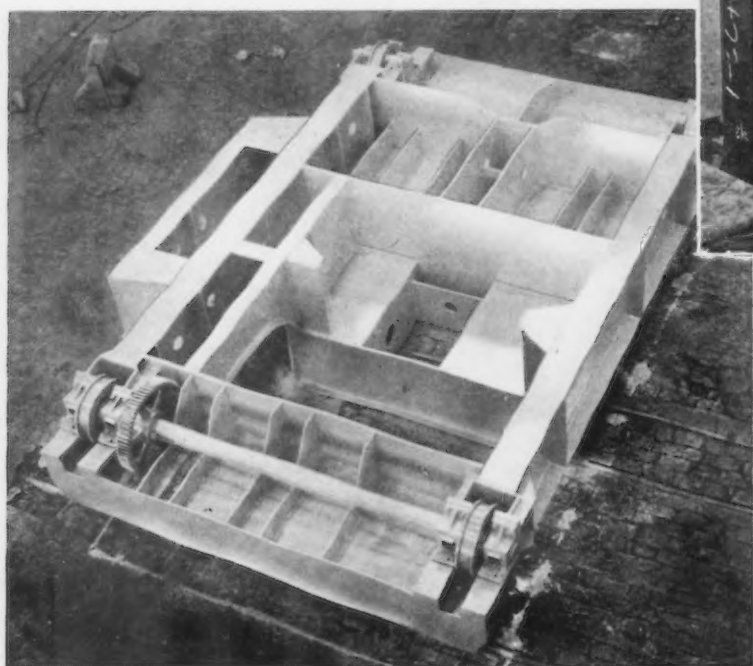
PUSHBUTTON control and the special lift hook on this overhead traveling crane simplify the job of handling coils of wire at the American Steel & Wire Co.'s plant at Joliet, Ill.

Courtesy, Harnischfeger Sales Corp., Milwaukee.



THIS is said to be the world's largest welded trolley frame yet built. It weighs 20,300 lb. and is constructed of standard structural rolled shapes welded together. It is for the main hoist of an 80-ton overhead traveling crane.

Courtesy, Cleveland Crane & Engineering Co., Wickliffe, Ohio



HE needs no helper. For by means of pushbutton control, suspended from the overhead traveling crane above, this man alone will handle the placing of this stator frame on pedestals in horizontal position.

Courtesy, General Electric Co., Schenectady, N. Y.

CALL THEM (Continued)



THIS electric hoist with its trolley beam and runway serves a group of feed rolls for a coiling machine at the plant of the Acme Steel Co. Delays are avoided by providing plenty of hoisting service and confining it to the group,

Courtesy, Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y.



LIFTING magnets execute a triple play. It's bad enough to have to lift one of these huge rolls of sheet steel without having to handle three at once. But the magnets simplify the problem.

Courtesy, Electric Controller & Mfg. Co., Cleveland.

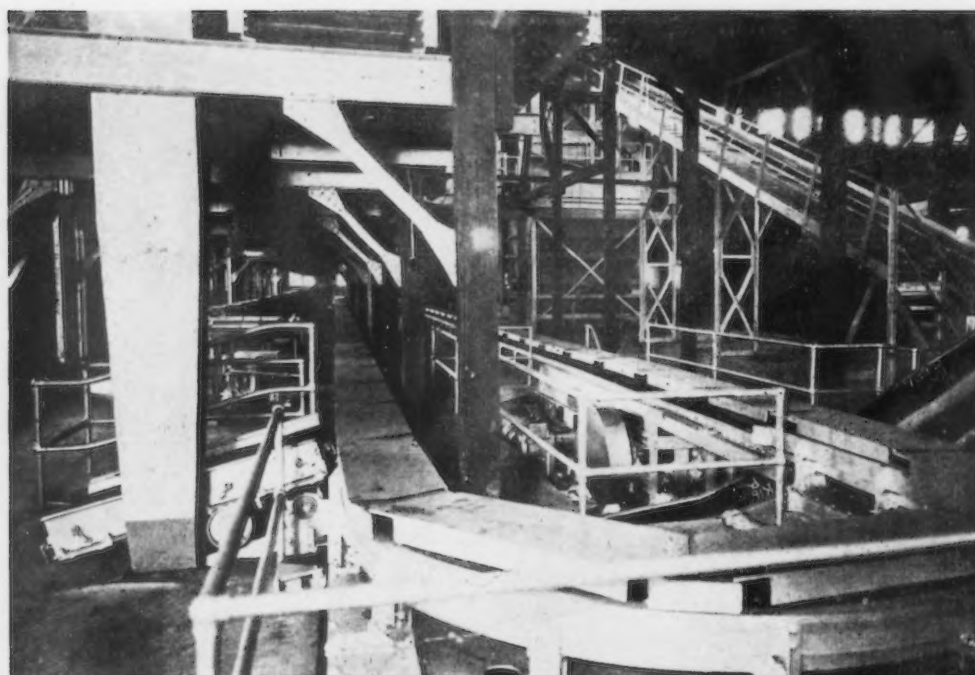


ON the way out. The production line principle is applied to boxing the product for shipping at the plant of the Cleveland Graphite Bronze Co. The four-wheel trucks form the moving conveyor system in this case.

Courtesy, Colson Co., Elyria, Ohio.



HOT STUFF—AND PLENTY



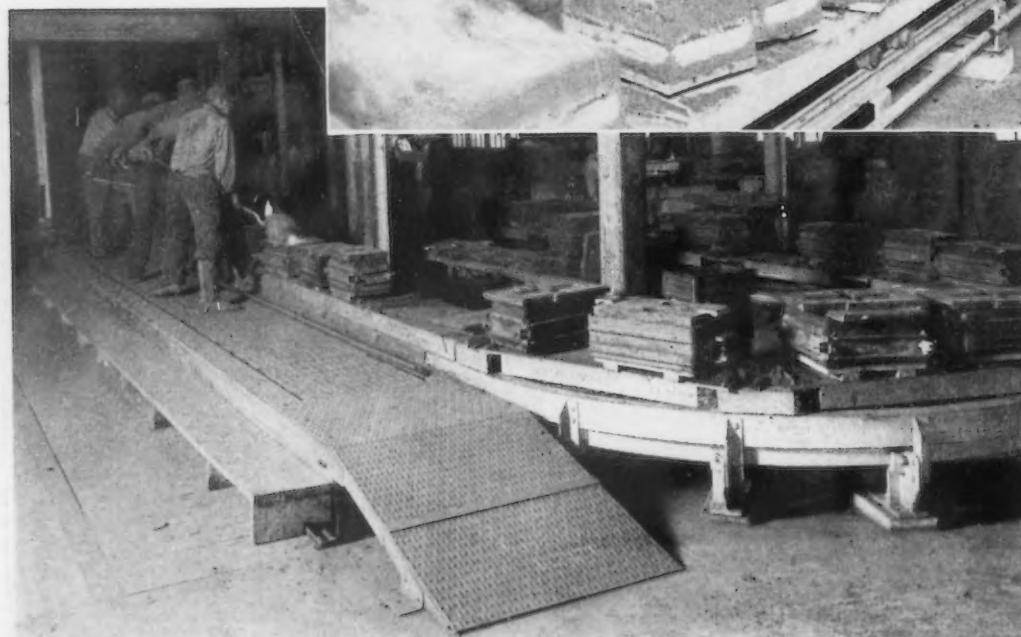
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RUNAROUND loop-type mold conveyor in the modernized foundry of the Gem City Stove Co. A vibratory shakeout screen is part of the installation. At the right, an inclined belt carries the used sand to the tempering equipment.

Courtesy, C. O. Bartlett & Snow Co., Cleveland

ALL aboard for the shakeout. Poured molds at the Gem City Stove Co. en route to the vibrating screen. A rather unusual action picture from good foundry practice.

Courtesy, C. O. Bartlett & Snow Co., Cleveland.

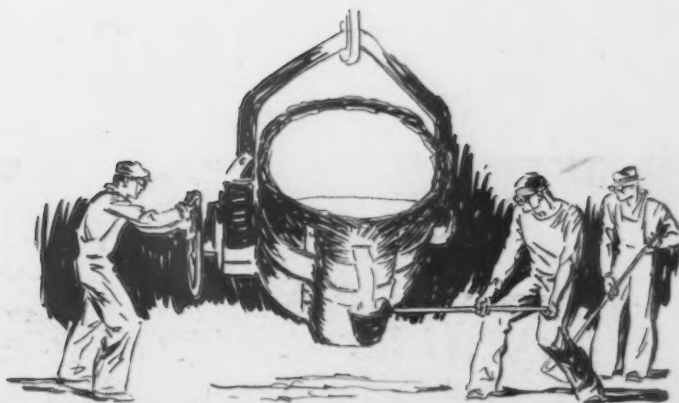


THE pouring station has a moving platform underfoot, keeping pace with the mold conveyor. Note the way in which the molds go "round the loop."

Courtesy, C. O. Bartlett & Snow Co., Cleveland.

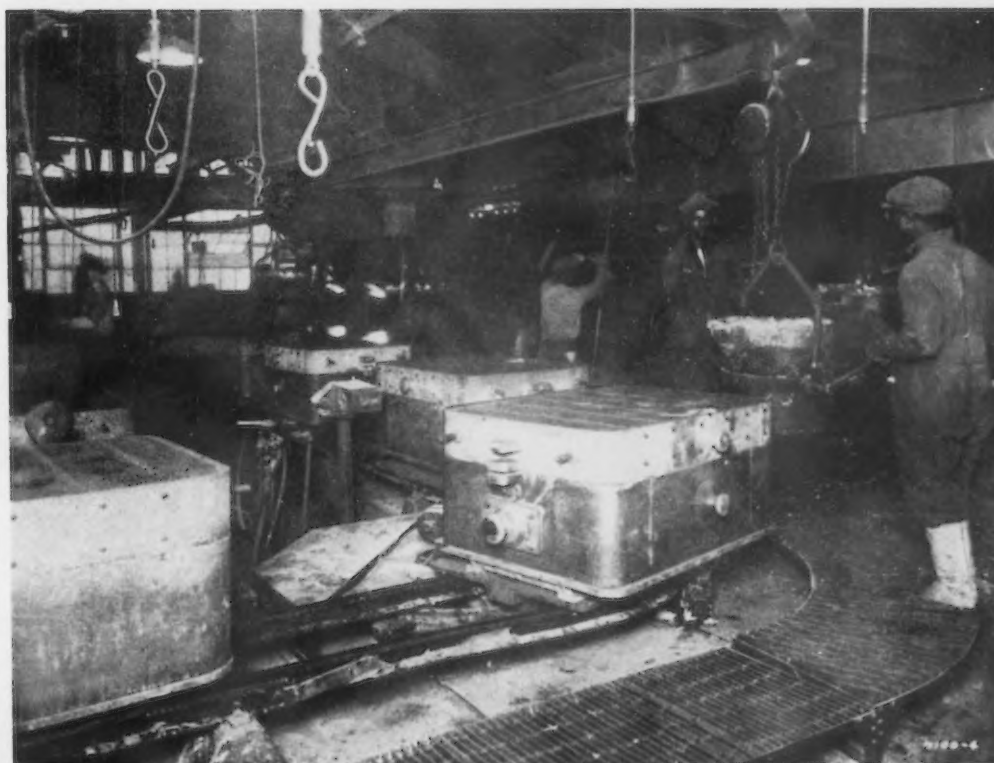
OF SAND

BOTH ARE MOVED MECHANICALLY IN THE MODERN MECHANIZED FOUNDRY.



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PACKARD cylinder block molds on the foundry conveyor molding line. At the left are the hoppers for the core sand and the tables on which these cores are made up.

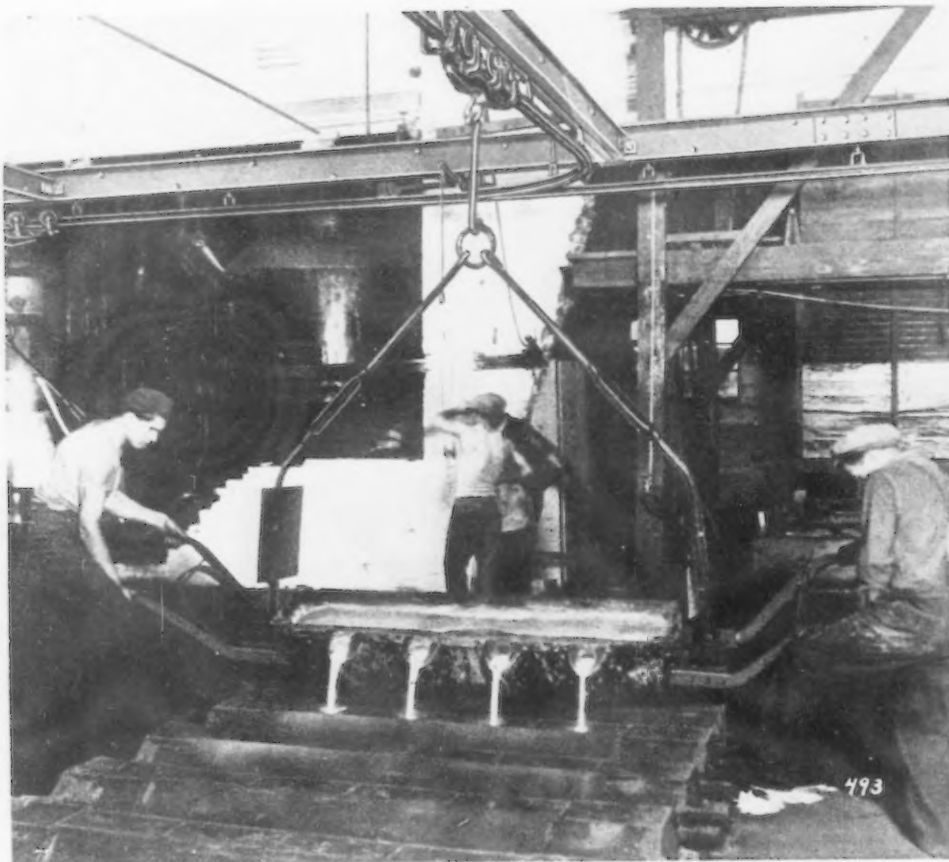
Courtesy, National Engineering Co., Chicago.



THE pouring station for cylinder molds at the Packard Motor Car Co. foundry. The conveyor system saved 40 per cent in labor.

Courtesy, National Engineering Co., Chicago.

HOT STUFF—AND PLENTY

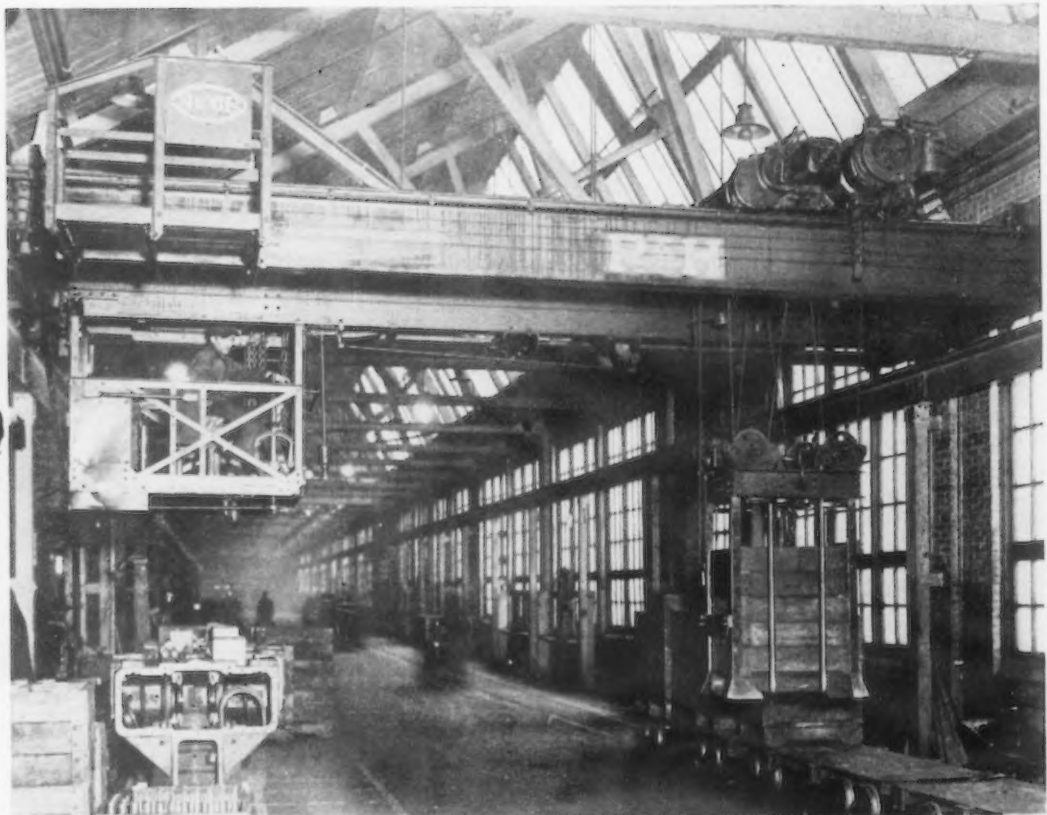


▲ ▲ ▲
FOUR-IN-ONE pouring at the plant of the Buffalo Pipe & Foundry Co. Heat deflectors protect the ladle men and the monorail insures pouring alinement.

Courtesy, American Monorail Co., Cleveland

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HANDLING 5-ton capacity flasks at the plant of the Caterpillar Tractor Co., Peoria. A good illustration of neatness and of the coordination of ground and air transportation.

Courtesy, Harnischfeger Sales Corp., Milwaukee



OF SAND (Continued)

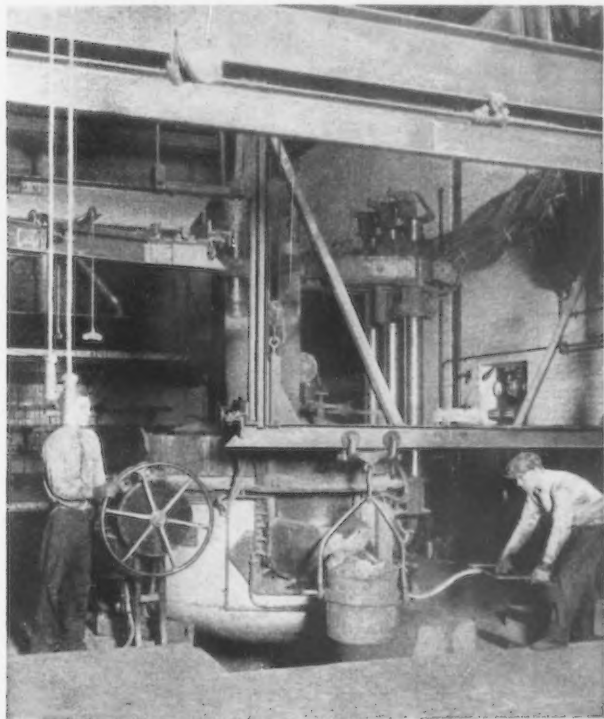
IN the foundry of the Columbia Castings Corp., two lines of monorail extend throughout its length, distributing hot metal.

Courtesy, American Monorail Co., Cleveland.



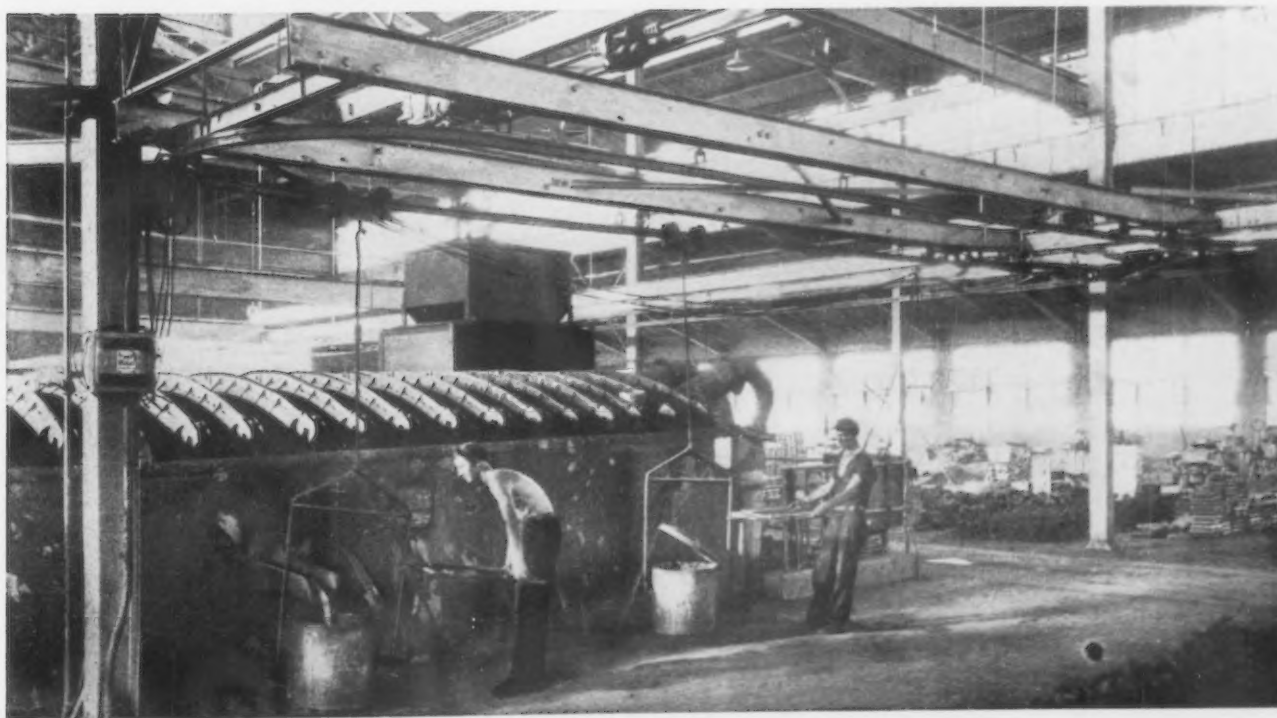
AT the new foundry of the DeLaval Separator Co., the track hoist is used for handling ladles to furnace spout to provide clearance of the furnace electrodes when tilted.

Courtesy, Loudon Machinery Co., Fairfield, Iowa.

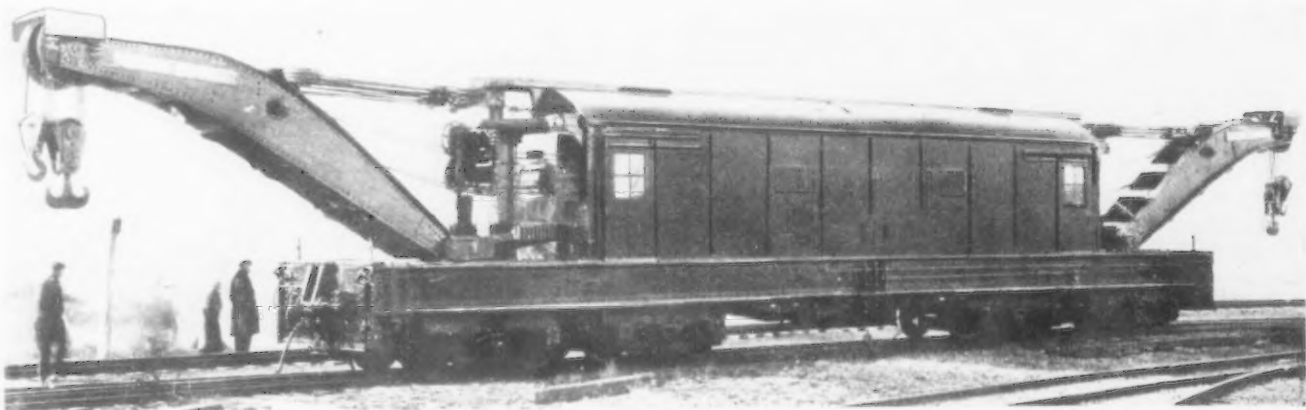


AT the furnace is a loop of monorail track connecting with the main lines running through the foundry. The furnace line has an 8-in. drop to get the ladles under the pouring spout.

Courtesy, American Monorail Co., Cleveland.

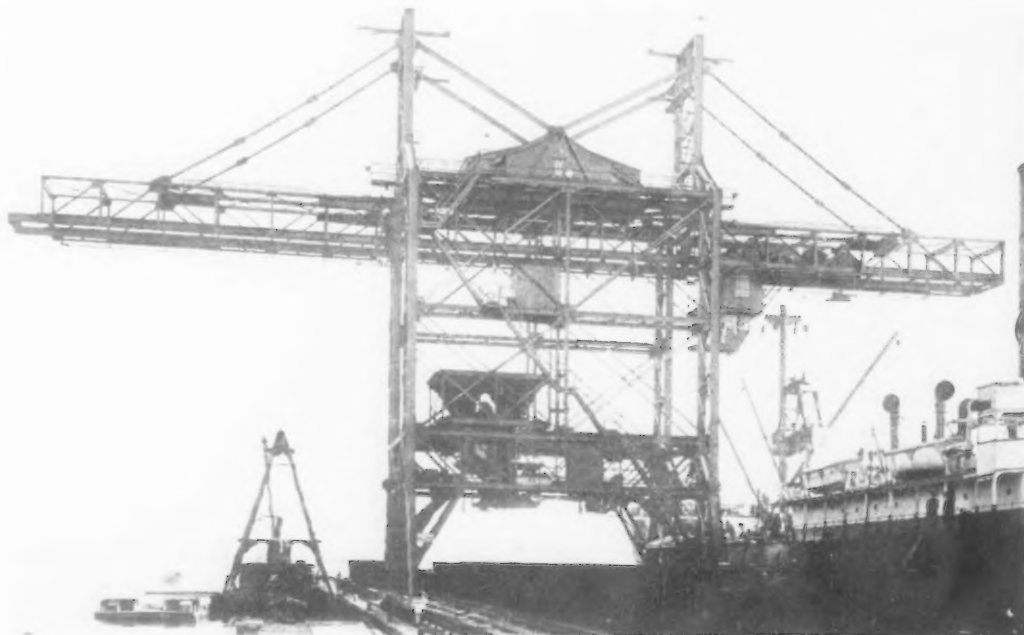


YOU DON'T SEE THESE



▲ ▲ ▲ THIS is the first gas-electric powered wrecking crane ever built. It is designed to work in underground tunnels with close clearance. The lifting capacity is 105 tons at each end. ▲ ▲ ▲

Courtesy, Industrial Brownhoist Corp., Cleveland.



▲ ▲ ▲ AN unusual gantry. The overhanging cantilevers on each side are hinged to clear shipping. A traveling hopper discharges weighed material either directly into open cars or into box car loaders mounted on the crane sills. A car puller is part of the apparatus and is used for spotting. The crane is powered by ten electric motors.

Courtesy, Wellman Engineering Co., Cleveland.

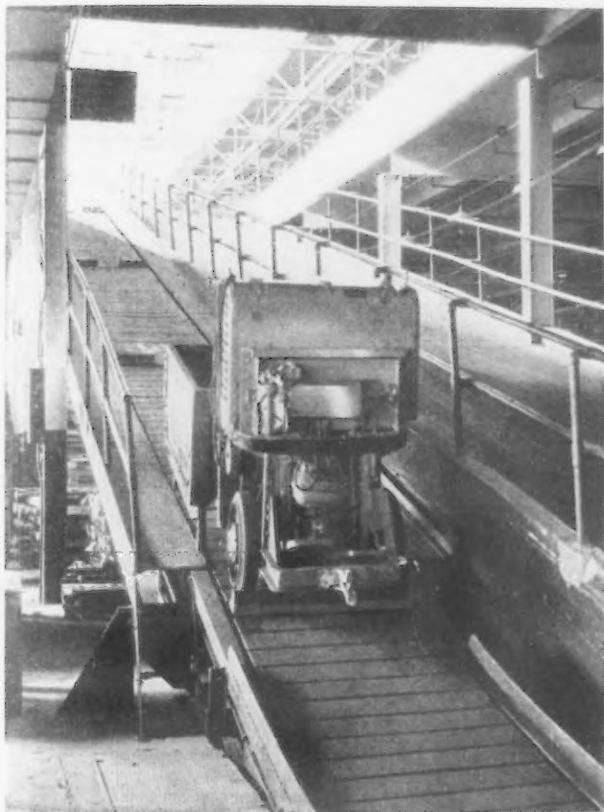
▲ ▲ ▲ THIS is the "world's largest electric truck." It just happens that it is used in California where they have the biggest and best of everything. But this is one time that you can believe it. ▲ ▲ ▲

Courtesy, Edison Storage Battery Co., Orange, N. J.



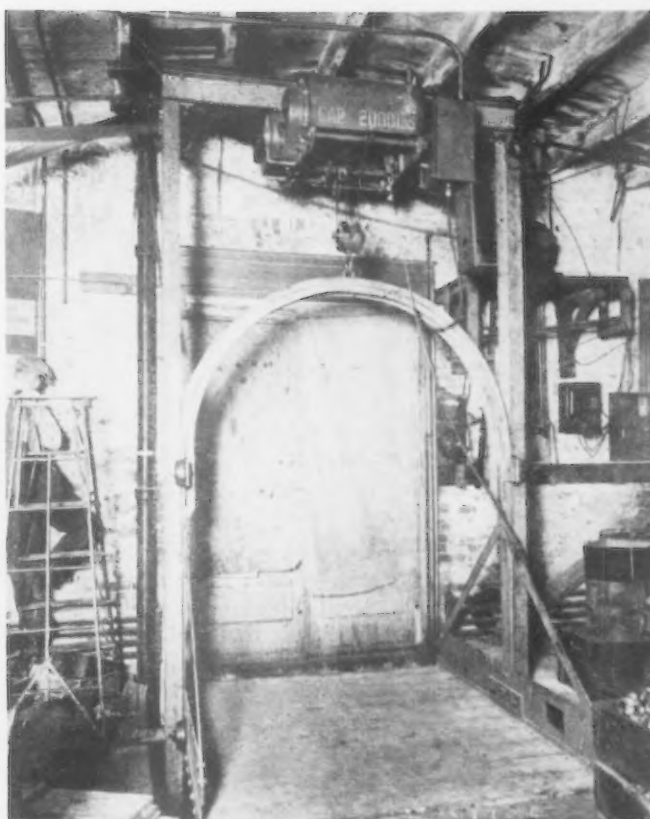
EVERY DAY

UNUSUAL INSTALLATIONS, APPARATUS AND METHODS FOR MECHANICAL TRANSPORTATION.



THIS inclined slat conveyor is shown taking an electric lift truck "upstairs." The dogs under the wheels drop automatically when the level is reached. Trucks come down on the ramp to the right.

Courtesy, Mechanical Handling Systems, Inc., Detroit.



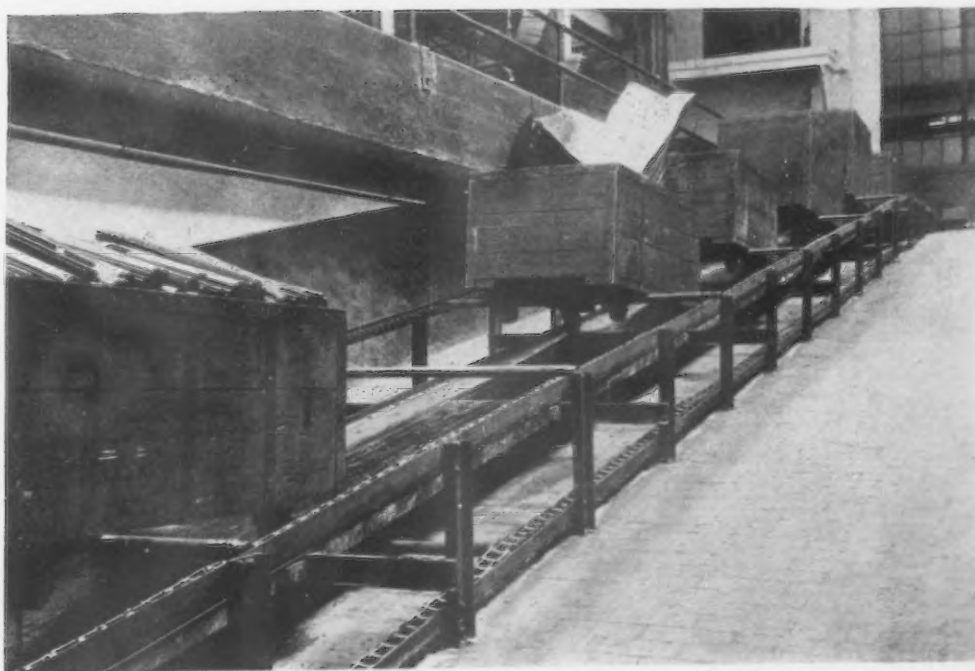
SIMPLIFYING the elevator problem. The low head room required by this electric hoist is one of the features that fits it for the job in this particular application.

Courtesy, American Engineering Co., Philadelphia



GOING up—and keeping the load on the level. This ingenious arrangement substitutes, at low cost, for an elevator and does away with the need of an operator. It is carrying sheet metal parts from one floor level to another.

Courtesy, Mechanical Handling Systems, Inc., Detroit.



THE "YARD GANG" IS

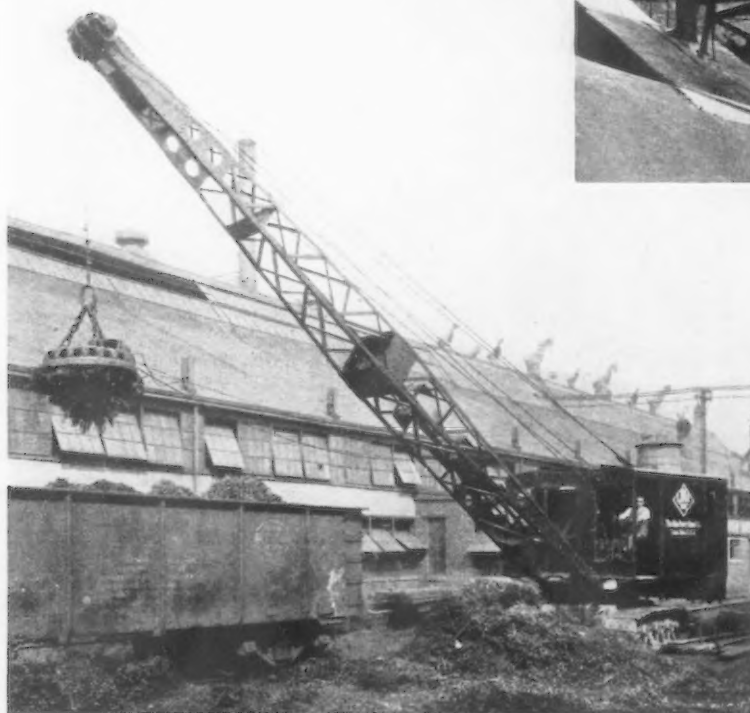
AT the Waukesha Motor Co., two of these 110-cu. yd. bins are used for the storage and loading of turnings and borings. They are directly over a side track and a car can be loaded by gravity in about 40 min.

Courtesy, Butler Bin Co., Waukesha, Wis.



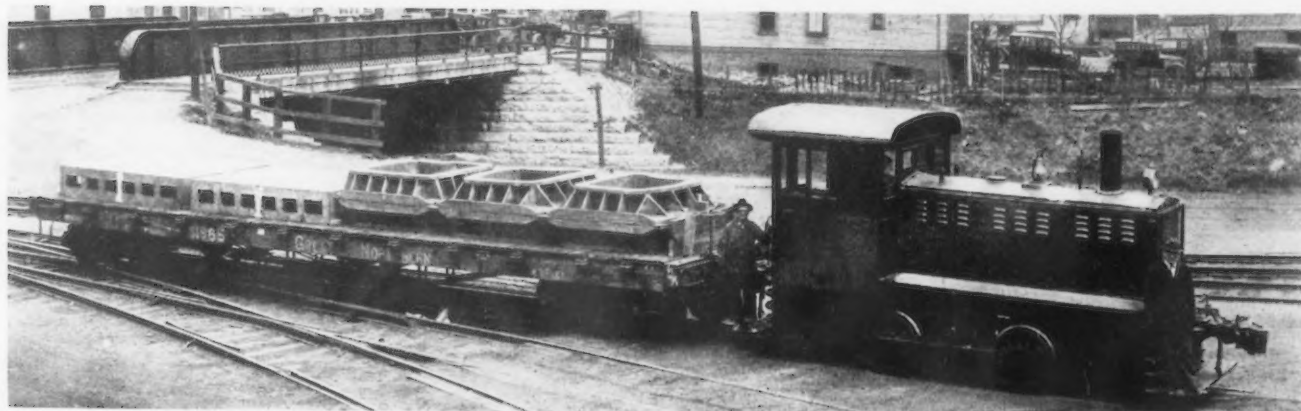
IT would be quite a job to pick up and load these turnings if it were not for this crawler crane and its lifting magnet. When it has to work on non-magnetic material a bucket or crane hook is substituted for the magnet.

Courtesy, Ohio Power Shovel Co., Lima, Ohio.



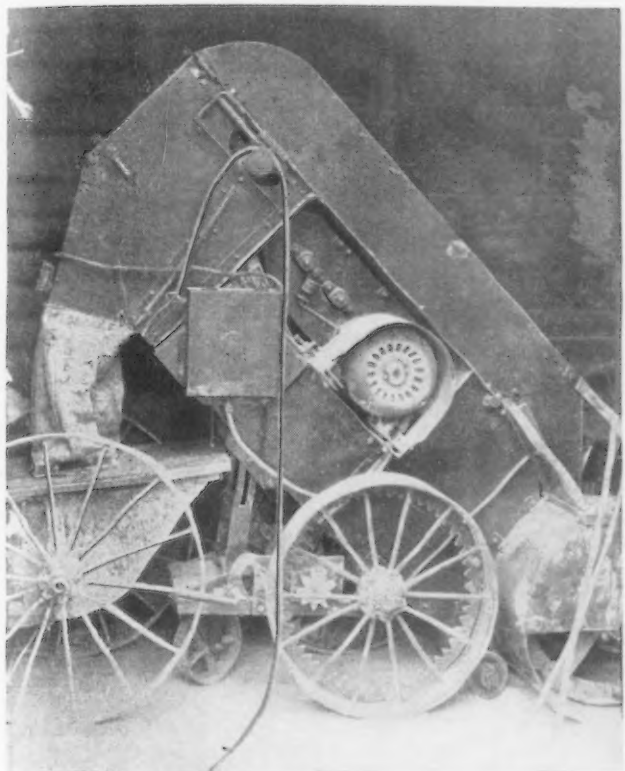
INDUSTRIAL locomotives play an important part in the general scheme of mechanical handling. This one is a gasoline locomotive and is shown at work transferring heavy castings from one plant to another.

Courtesy, Milwaukee Locomotive Mfg. Co., Milwaukee.



OUT OF DATE

BECAUSE MECHANICAL HELPERS DO THE WORK MUCH MORE EFFECTIVELY.



A NEW member of the mechanical handling family. A small bucket loader that goes right into a box car and handles bulk material up to 4-in. lumps at the rate of $\frac{1}{2}$ cu. yd. a minute. Also used for loading wheelbarrows, buggies or conveyor hoppers.

Courtesy, Barber-Greene Co., Aurora, Ill.



MOVING day for boilers. And the moving van, in this case, is a crawler crane, which seems to be handling this job without any trouble.

Courtesy, National Equipment Corp., Milwaukee.



TWO of these 4-ton gaso-line locomotives are at work at the Martin Dennis Co. They haul 300 tons per day of 8 hr. over an average $\frac{1}{4}$ -mile haul, including grades of 5 per cent, and sharp curves of 10-ft. radius.

Courtesy, Pate-Roel-Heath Co., Plymouth, Ohio.



THE "YARD GANG" IS

GOING up a steep hill via belt conveyor. One would think that crushed stone might slide back on this grade but it doesn't. The 30-in. belt is 525 ft. long in this installation.

Courtesy, Cincinnati Rubber Mfg. Co., Cincinnati



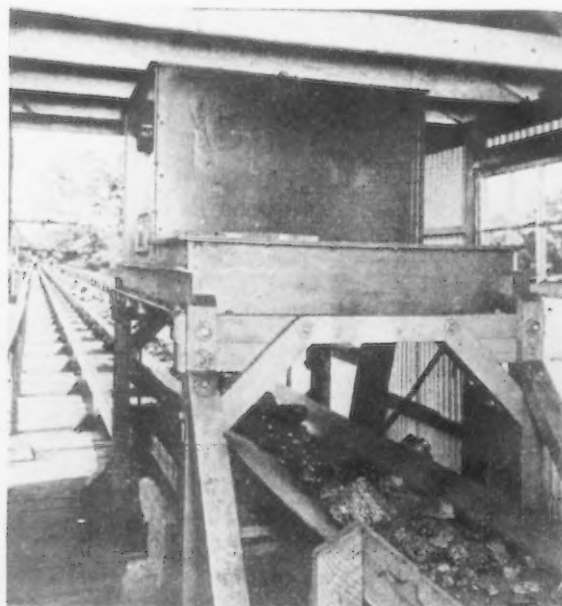
GOING to bat as a yard crane. This crawler is handling a large steel casting which has just come into the plant, and will deliver it wherever the boss wants it put.

Courtesy, National Equipment Corp., Milwaukee

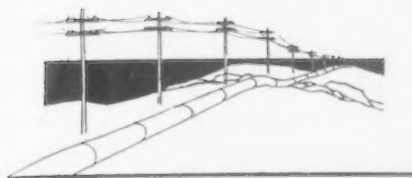


WEIGHING on the move is a part of modern bulk conveying. Inventive genius has solved this problem and operatorless weighing is cared for by the combination of mechanical and electrical apparatus. And it is accurate, too.

Courtesy, Mettler Scale Mfg. Co., Passaic, N. J.



OUT OF DATE (Continued)



THIS gasoline locomotive (right) of 12-tons rating, is saving 50 per cent over the former hauling method, according to its user, the Cooper-Bessemer Corpn.

Courtesy, Pate-Root-Heath Co., Plymouth, Ohio.

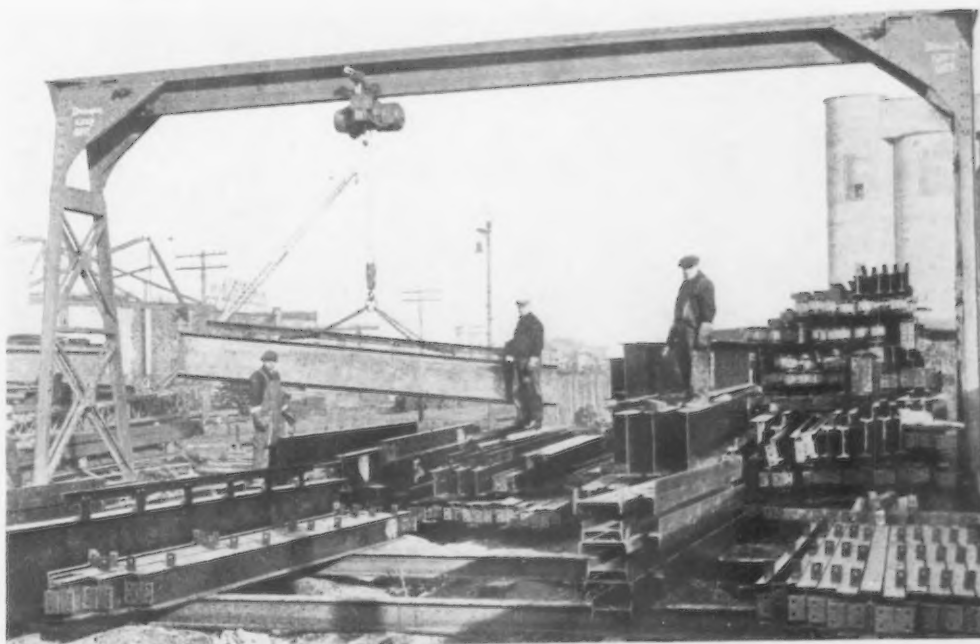


GASOLINE industrial locomotives apply the automotive advantages to track haulage. This one has four-speed transmission, giving it flexibility with respect to starting, pull, load and grade.

Courtesy, Milwaukee Locomotive Mfg. Co., Milwaukee.

STACKING steel for storage in the yard of Reuter Brothers, Chicago. The crane was doing all of the work at the time that this picture was taken. Ordinarily, the men help some, too.

Courtesy, Harnischfeger Sales Corp., Milwaukee.



The Iron Age, April 9, 1931—1187

IT TAKES PULL TO GET



AN electric tractor in this steel plant handles ten cars of scrap from the shears to the baling press.

Courtesy, Edison Storage Battery Co., Orange, N. J.



FROM car to warehouse and from warehouse to manufacturing departments, wire for the manufacture of animal traps goes via electric tier lift truck at the plant of the Animal Trap Co.

Courtesy, Crescent Truck Co., Lebanon, Pa.

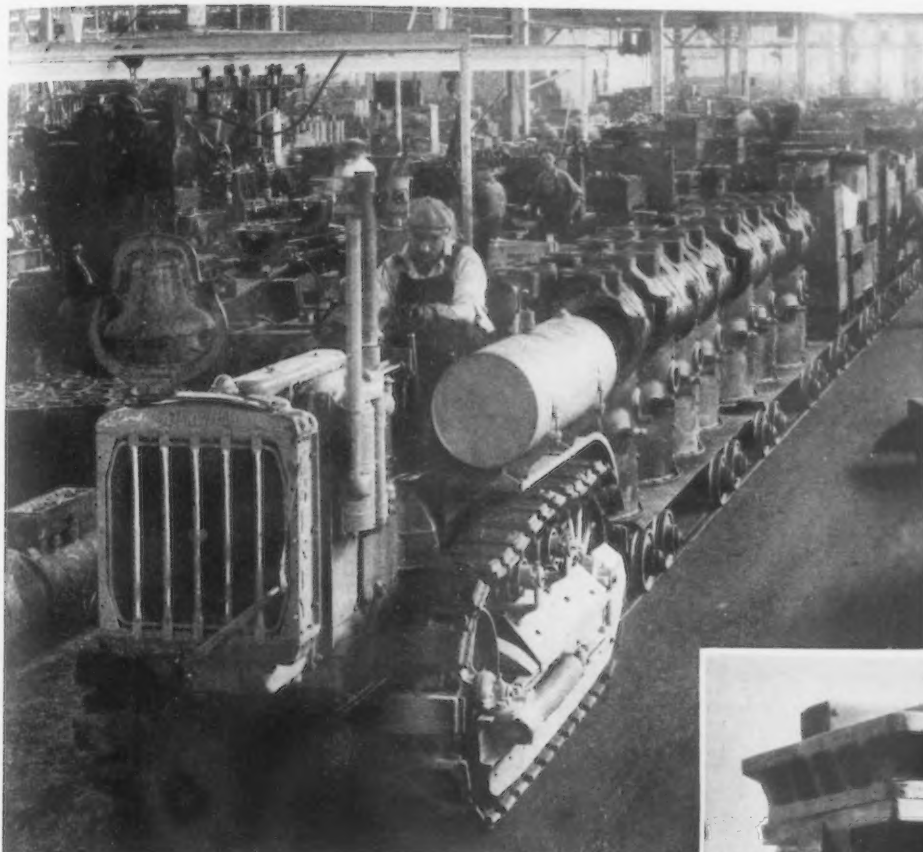


HERE is a gas fed "shop mule" which lifts as well as carries. The crane mounted on the body comes in handy very frequently. Incidentally, there is a good "safety campaign" idea in the background of this picture.

Courtesy, W. F. Hebard & Co., Chicago.

THESE JOBS

AND IT TAKES PULLING POWER TO HOLD THEM.
SOME IDEAS, HERE, FOR GROUND TRANSPORTATION.



WHERE is the big steel die going with the little truck? You'd be surprised! And also surprised to know that the truck in the picture weighs 6½ tons. Must be a big die at that rate. Yes, it weighs close to 30,000 lb.

Courtesy, Ellwell Parker Electric Co., Cleveland.

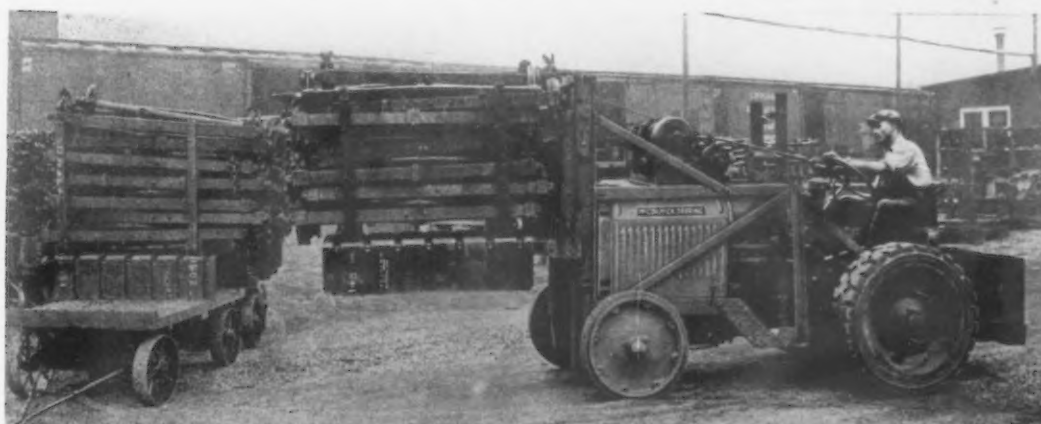
BY equipping this Caterpillar with rubber tracks, it is used as a switch engine on the plant narrow-gage railroad, inside of the plant as well as outdoors.

Courtesy, Caterpillar Tractor Co., Peoria, Ill.

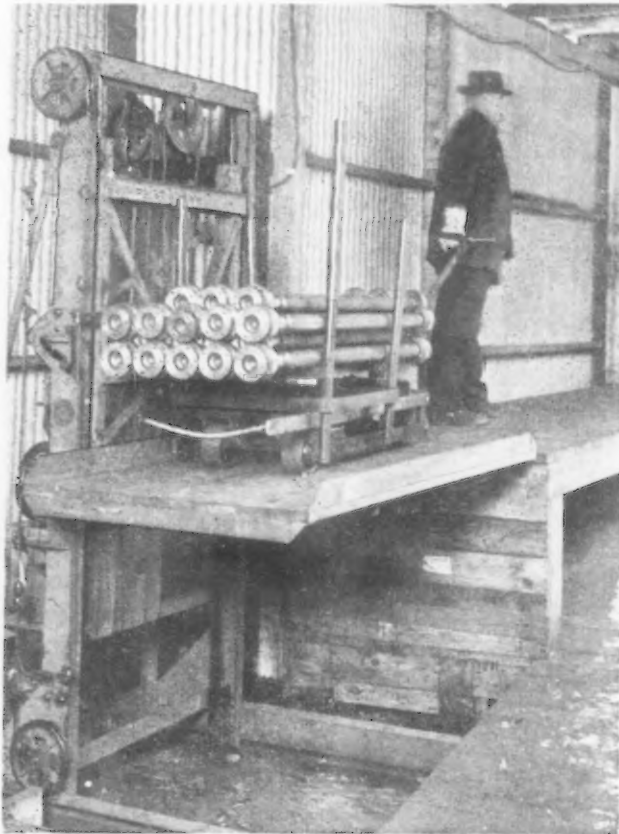


THIS lifting device enables the truck operator to load skids on the trailers, convey the trailers and then unload the skids at the final destination.

Courtesy, International Harvester Co., Chicago.

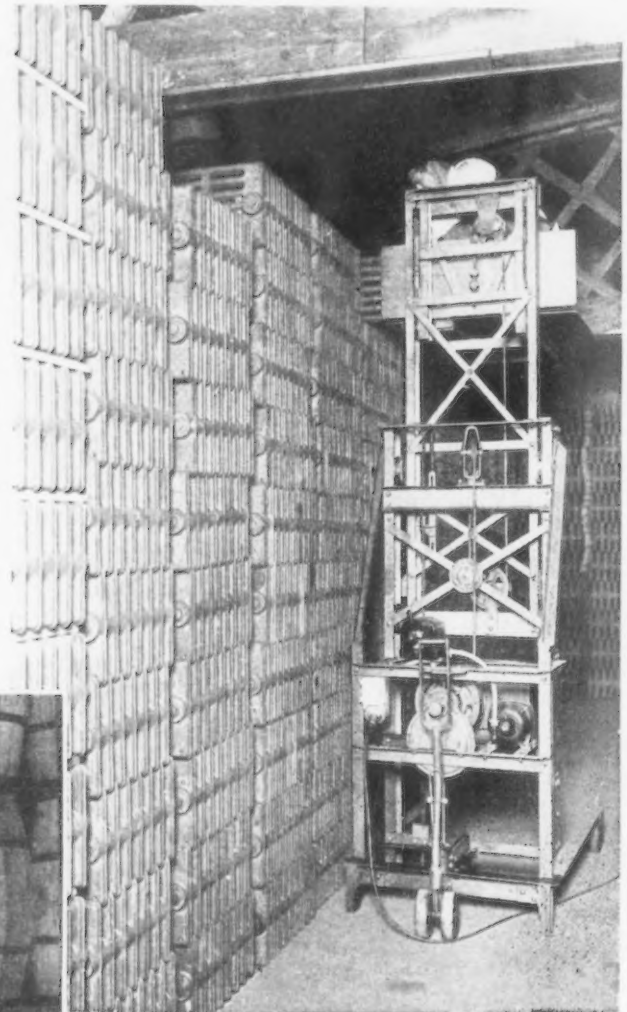


IT TAKES PULL TO GET



INSTEAD of seven men having to push this loaded truck up to the ramp, one man with this lifter does the job in 30 sec. Ramps are "OK" on the downhill trip, but uphill work makes slow going.

Courtesy, Economy Engineering Co., Chicago.



THIS 1000-lb. capacity electric telescoping lifter is at work in the plant of the Burnham Boiler Co. By means of it, radiator sections are stacked to ceiling height without effort.

Courtesy, Economy Engineering Co., Chicago.



THE same electric tier lift truck which brings the raw material into the factory stacks up the finished product in the form of barrels of animal traps, ready for shipment.

Courtesy, Crescent Truck Co., Lebanon, Pa.

THESE JOBS (Continued)

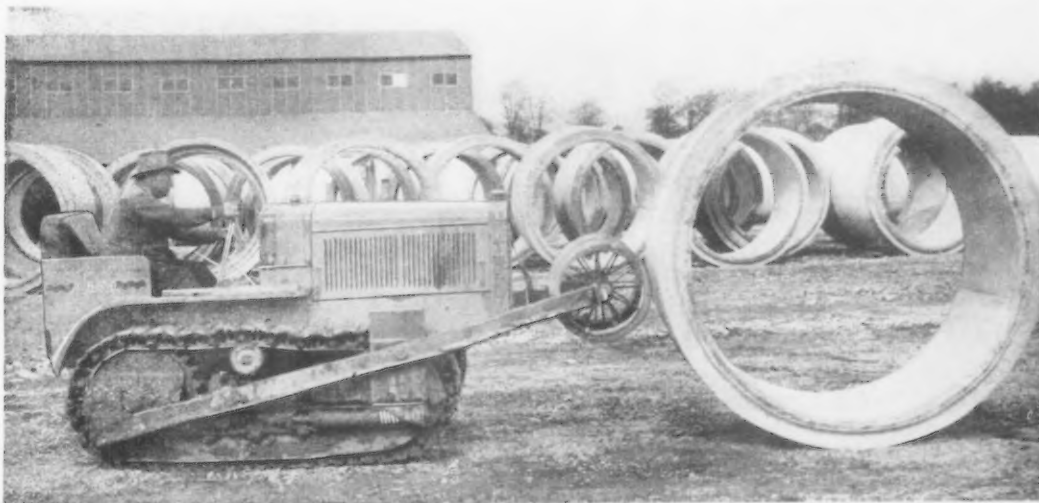
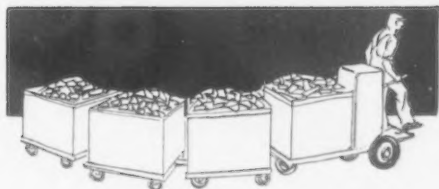


THESE dies are heavy. But they slide easily on roller conveyor sections, when brought level with the rack shelves by means of this 3000-lb. hand-operated lifter.

Courtesy, Economy Engineering Co., Chicago.

HERE comes the "shop mule." It is made of Ford model "AA" parts. It will work 24 hr. a day on an average of 4 gal. of gas and a pint of oil. This shows it arriving with a load of express material.

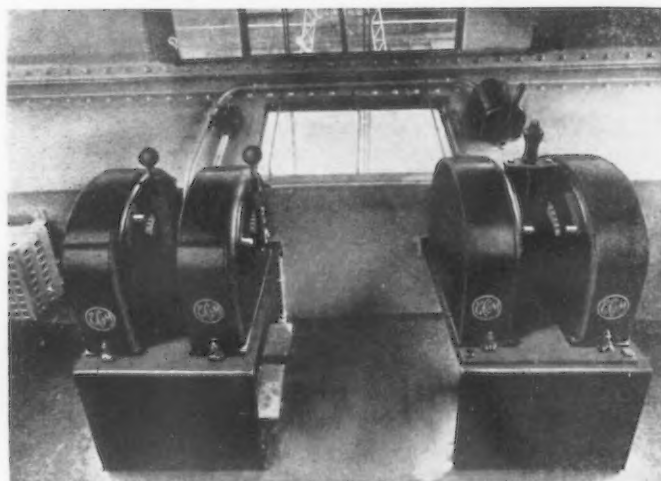
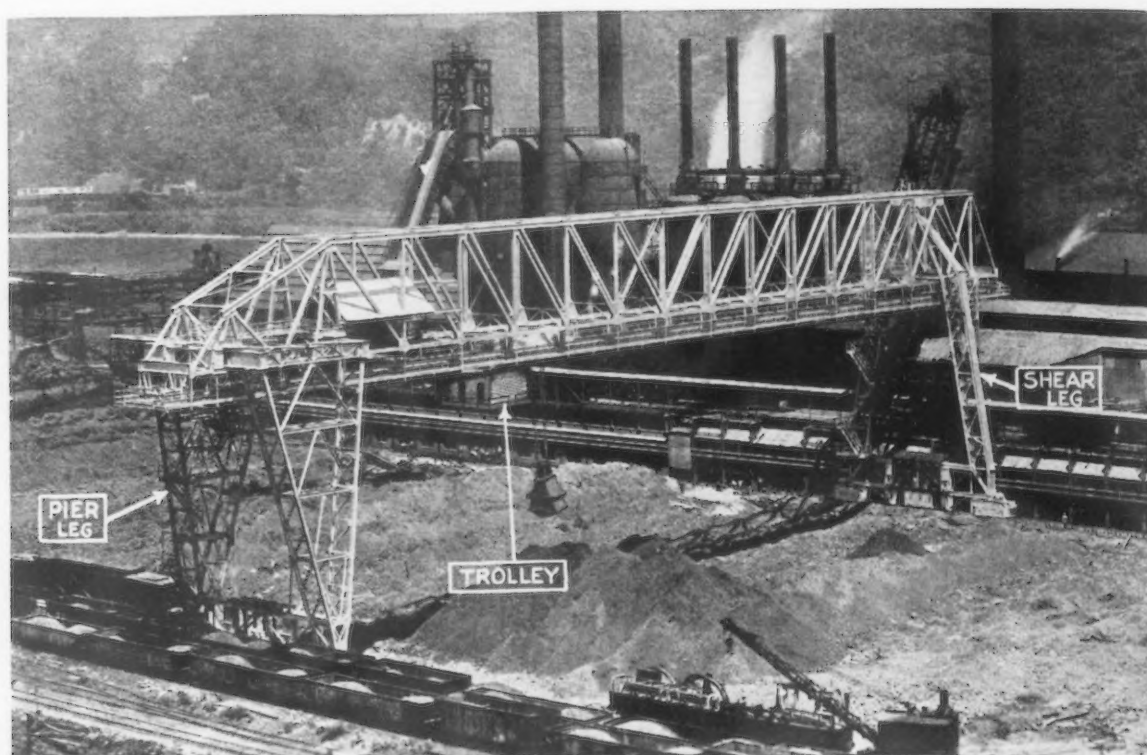
Courtesy, W. P. Hebard & Co., Chicago.



HERE'S a novel but efficient way of moving pieces that are round and will roll. The pushing wheels, combined with the product, produce an anti-friction bearing effect.

Courtesy, Caterpillar Tractor Co., Peoria, Ill.

AMONG THE HANDLING



INSIDE of the operator's cab on the ore bridge, showing the master switches. The one at the right controls the hoist; those at the left control bridge and trolley movements.

ONE of the modern giants of mechanical handling. A 314-ft. span, 12-ton ore bridge. The pictures show how it is electrically controlled.

Courtesy, Electric Controller & Mfg. Co., Cleveland.



BACK of the master switches is a compartment in the operator's cab known as the control room. Duplex time-current controllers for the trolley are shown at the left.



GIANTS

CARLOADS OR SHIPLOADS, IT MAKES NO DIFFERENCE TO THESE ELECTRIFIED MONSTERS.

▲ ▲ ▲

THE silo idea applied to coal. Daily truck tonnage has been increased 20 per cent, and car demurrage practically eliminated by the Rio Grande Fuel Co., through the use of this equipment. Not to mention the considerable saving in yard space and the elimination of waste.

Courtesy, Gifford-Wood Co.,
Hudson, N. Y.



THIS 7½-ton gantry handles bulk materials between ships, railroad cars and storage yard. Its 67-ft. luffing boom, which extends horizontally at the front, in this picture, can be raised almost to the vertical to clear ships when docking.

Courtesy, Cleveland Crane and Engineering Co., Wickliffe, Ohio.

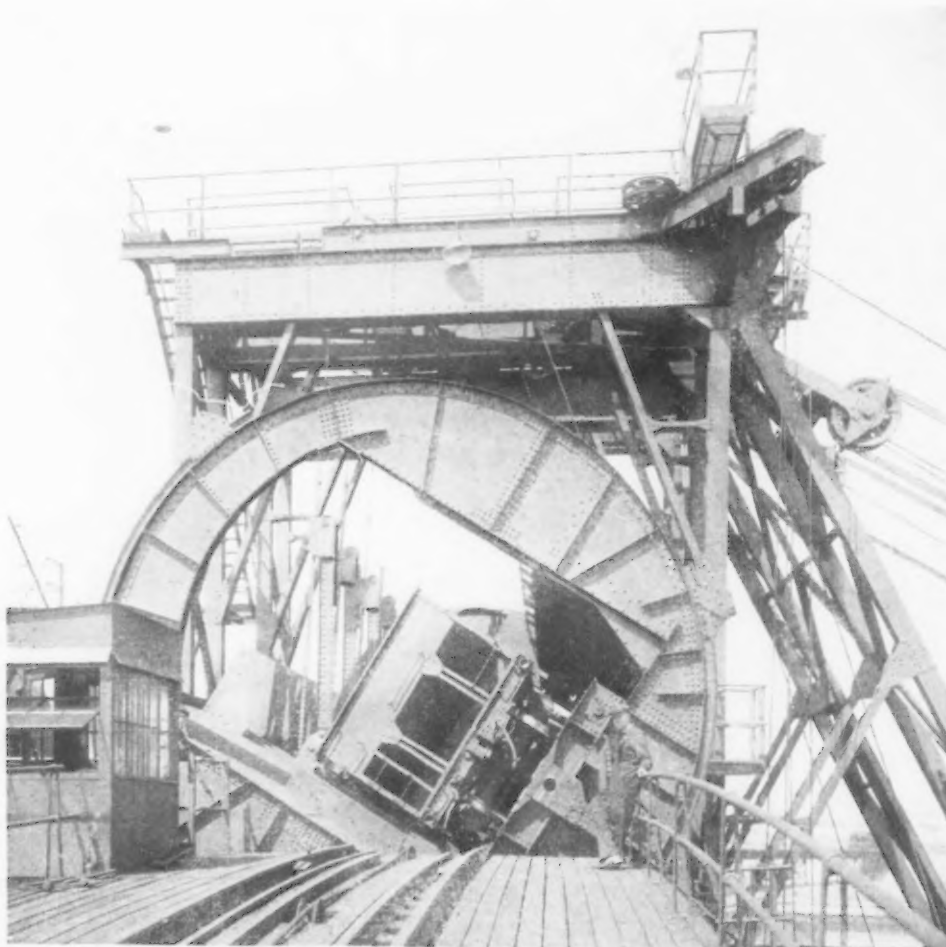


AMONG THE HANDLING GIANTS (Continued)



THESE "coke fiends" unload, transport and pile 600 tons of coke per day. The first is an unloader, working under the car, the second is a crawler mounted loader, and the third a drag type conveying machine. The three units, all portable, work together.

Courtesy, Barber-Greene Co., Aurora, Ill.



THE quickest way to unload a car of coal or other bulk material is to turn it upside down and spill the contents. This electrically actuated coal car dumper is transferring coal from rail to boat in just that way.

Courtesy, General Electric Co., Schenectady, N. Y.

GOING OVER THE TOP

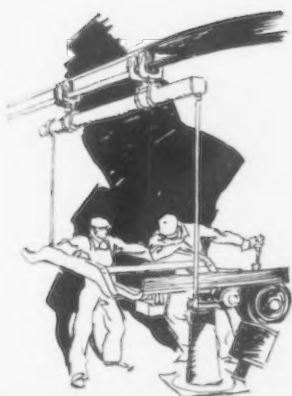
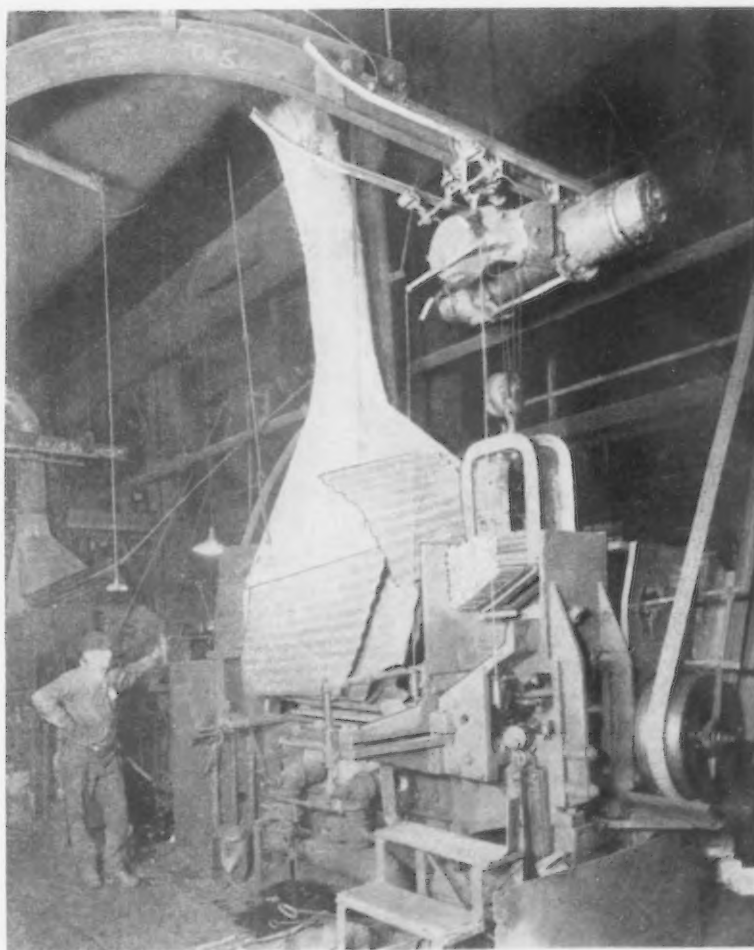
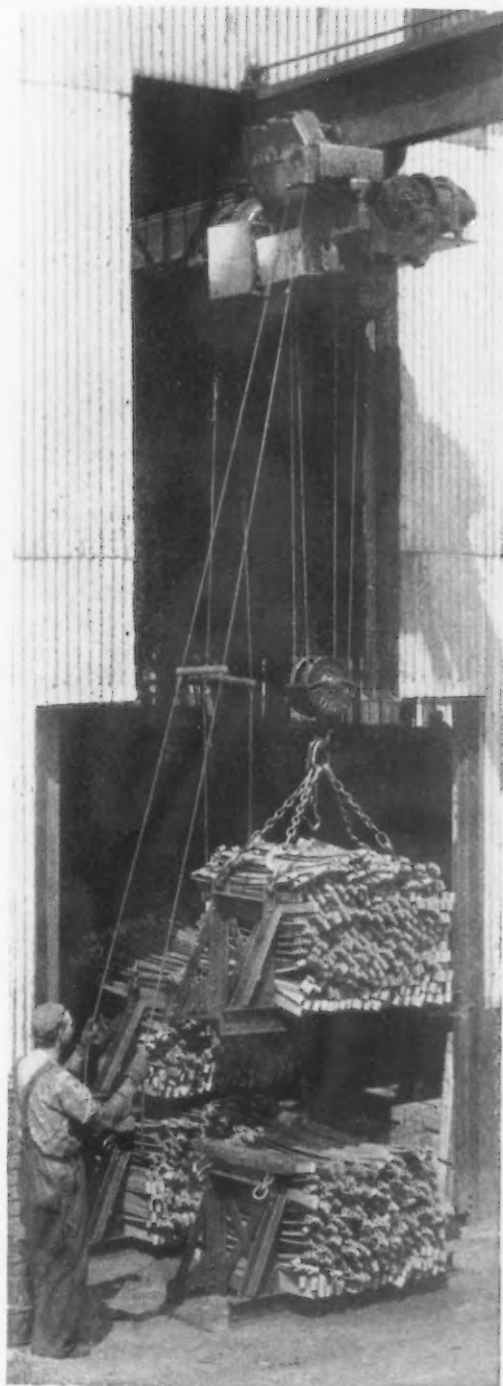
THAT IS WHAT THESE AERIAL
RAILROAD SYSTEMS ARE DOING IN
INDUSTRIAL HAULAGE.

RIGHT through the wall, proper openings being provided, of course, moves the floor-controlled monorail hoist at the Standard Steel Spring Co.'s Coraopolis, Pa., plant. Uninterrupted interdepartment and inter-building transportation is made possible. ▲ ▲

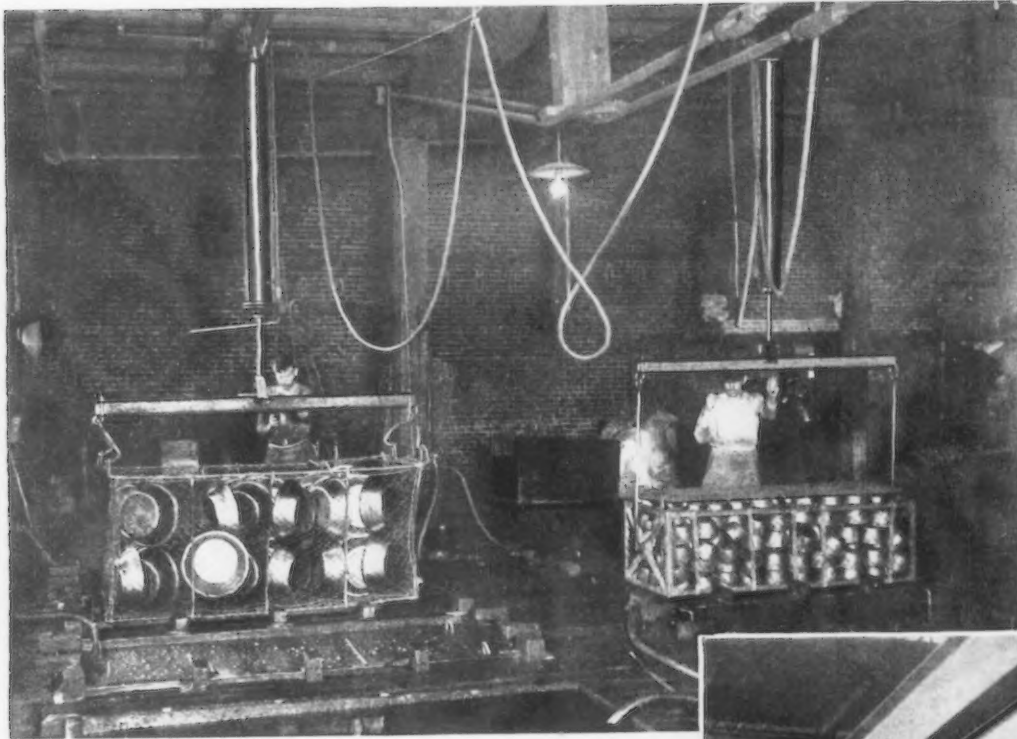
Courtesy, Euclid Crane & Hoist Co., Euclid, Ohio.

HERE is the way a load of bolts is put into the hopper of a bolt machine at the Oliver Iron & Steel Co. The frame of the carrier has a drop bottom which trips when about 3 in. from the bottom of the hopper. ▲ ▲

Courtesy, Loudon Machinery Co., Fairfield, Iowa.



GOING OVER THE

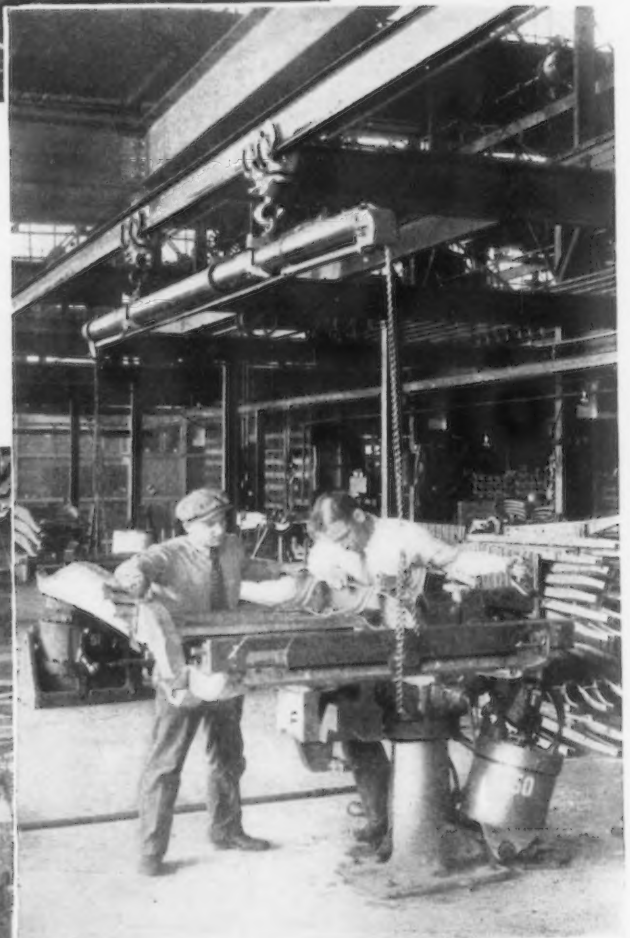
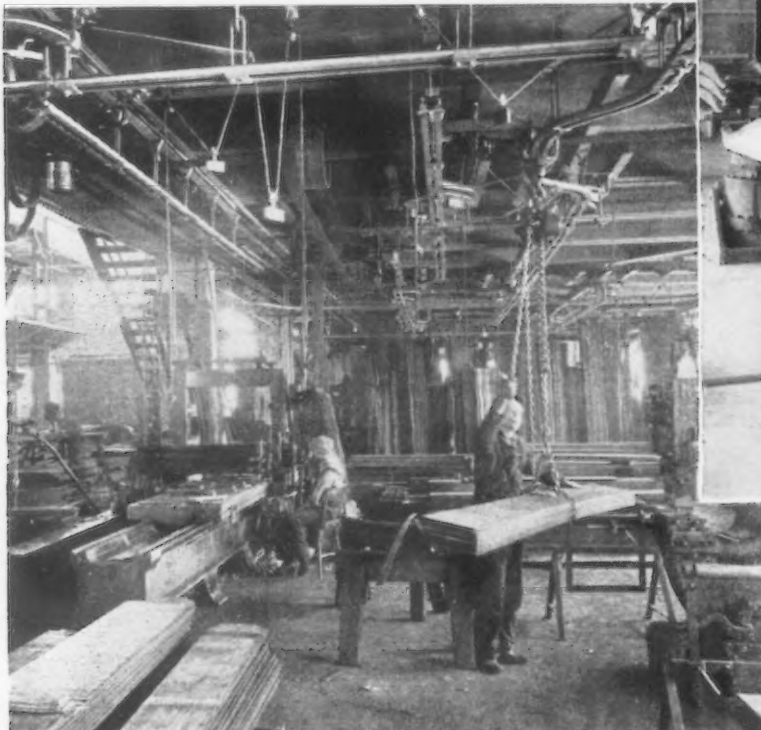


▲ ▲ ▲
IN and out via air hoist. These aluminum parts are dipped in acid solution, then rinsed and transported by the combination of air hoist and overhead monorail. A combination of vertical and horizontal mechanical handling.

Courtesy, American Monorail Co., Cleveland

▲ ▲ ▲
LOW headroom is no deterrent to overhead handling here. This method of rail suspension enables the operator to dodge the overhead countershafts and belts successfully also.

Courtesy, Grolan Mfg. Co., Dayton, Ohio.



A LARGE coil spring in the pipe suspended from the trolleys enables this auto frame to be on the same plane at both ends when put into the riveting machine. This unusual feature eliminates one man.

Courtesy, Loudon Machinery Co., Fairfield, Iowa

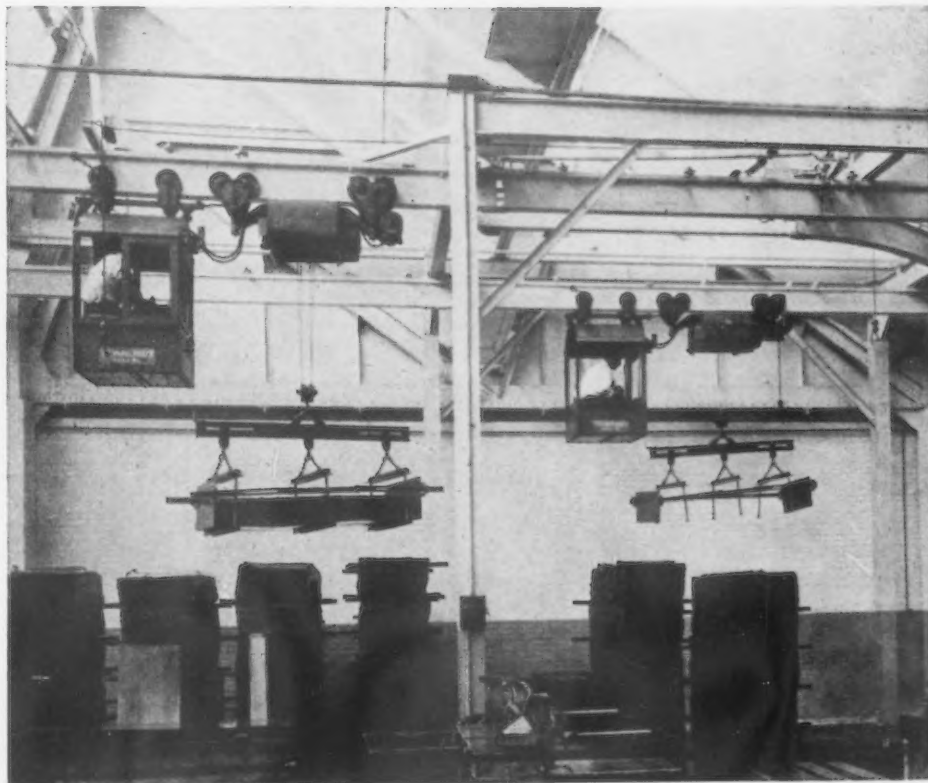
TOP (Continued)



AT RIGHT

THIS is the way that sheet steel, in bundles, is stored at the Atwater Kent plant. Stacks are adjacent to the shears. Note well designed carriers.

Courtesy, American Engineering Co., Philadelphia.



LOWER LEFT

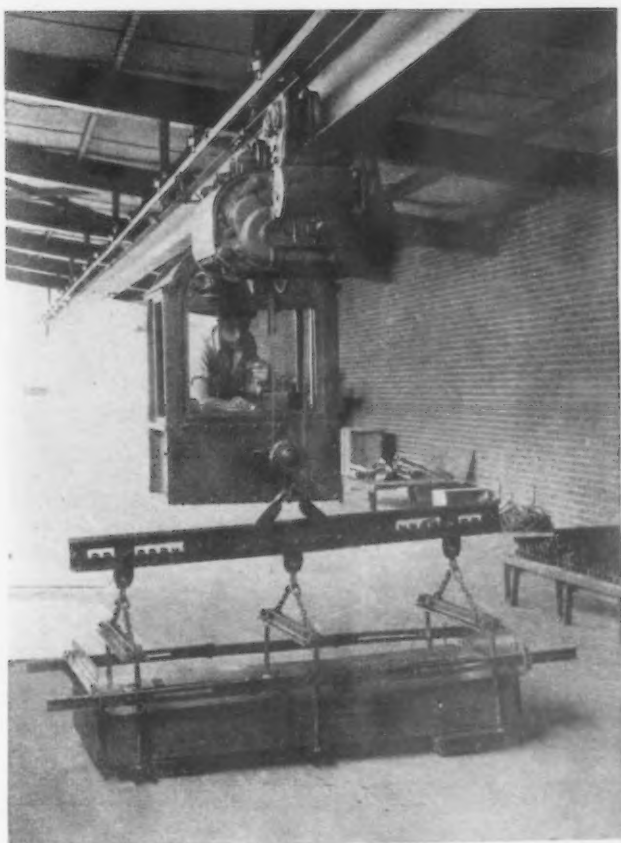
THE sheet steel shown being unloaded from the box car will soon be Atwater Kent radio parts. The motor trolley on monorail simplifies the handling problem.

Courtesy, American Engineering Co., Philadelphia.

LOWER RIGHT

IT'S a pipe. Quite easy to handle long lengths economically with the help of modern overhead conveniences of the sort shown. Note good idea for all around auto bumper.

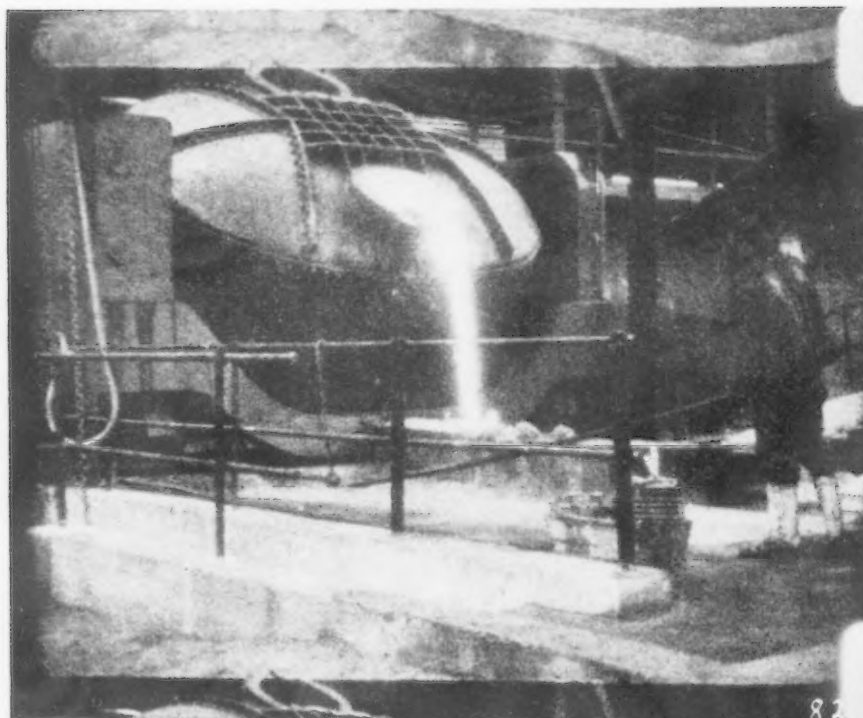
Courtesy, Harnischfeger Sales Corp., Milwaukee.



RATHER OUT OF THE

THE delivery end of a mass production boat-building handling system. At the Horace E. Dodge Boat & Plane Corp., this 6-ton gantry handles speed boats and cruisers directly from the shop floor to the water.

Courtesy, Marin Brothers, Inc., Philadelphia

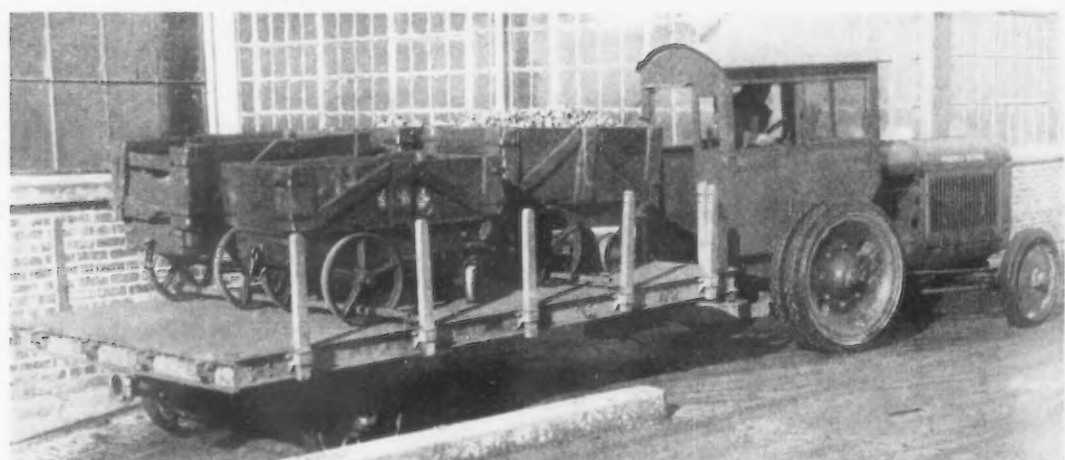


THE mechanical handling of hot metal became necessary when ladle capacity grew beyond the ability of human backs and arms to lift. Here's an example of one of the "big brothers" of the hot metal carrier family. A ladle car delivering the goods.

Courtesy, William B. Pollock Co., Youngstown

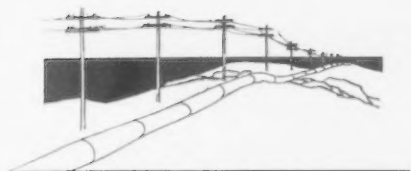
THIS method of conveying shop trucks is proving valuable. The trailer is the same height as the loading platform so that the trucks can be pushed on and off without lifting.

Courtesy, International Harvester Co., Chicago



ORDINARY

BUT TURNING OUT A BIG DAY'S WORK NEVERTHELESS



ANOTHER section of the Texas Panhandle-Chicago \$110,000,000 gas pipe line. A welded pipe section is being placed on the skids by the winch-equipped tractor.

Courtesy, Caterpillar Tractor Co., Peoria, Ill.



ANOTHER view of the Texas Panhandle to Chicago gas pipe line showing lengths coupled and on skids, preparatory to lowering into the ditch.

Courtesy, S. R. Dresser Mfg. Co., Bradford, Pa.

DELIVERY of natural gas over long distances via pipe line is one kind of material handling that is rapidly gaining vogue. This view shows the bolting up of the mechanical coupling joining the 80-ft lengths composed of two 40-ft. sections previously joined by electric welding. This is the Continental Construction Co.'s 1000-mile pipe line.

Courtesy, S. R. Dresser Mfg. Co., Bradford, Pa.



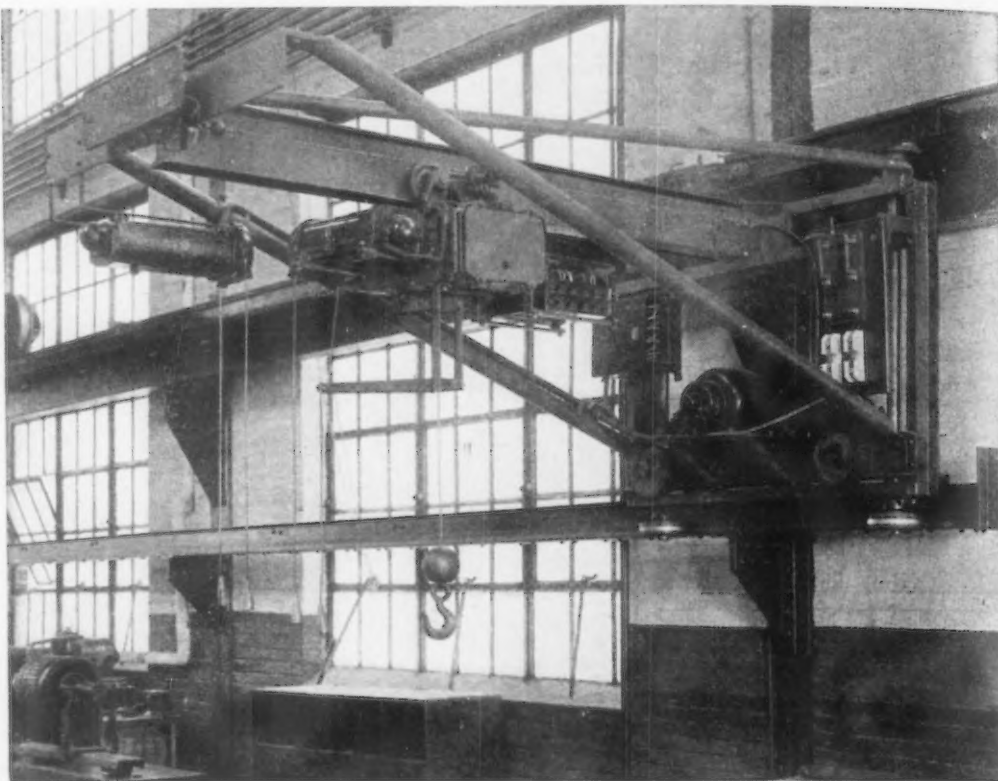
The Iron Age, April 9, 1931—1199

RATHER OUT OF THE ORDINARY (Continued)

▲ ▲ ▲

THIS traveling wall crane, of 1000-lb. capacity, is part of the handling equipment at the repair shops of the Cleveland Railway Co. The idea is applicable elsewhere in cases that permit of rails mounted on walls.

Courtesy, Euclid Crane & Hoist Co., Euclid, Ohio



▼ ▼ ▼

HERE are a pair of coal car dumpers working in conjunction with coal unloading equipment at a pier of the Pennsylvania Railroad. The inclines switch the empties back by gravity.

Courtesy, General Electric Co., Schenectady, N. Y.



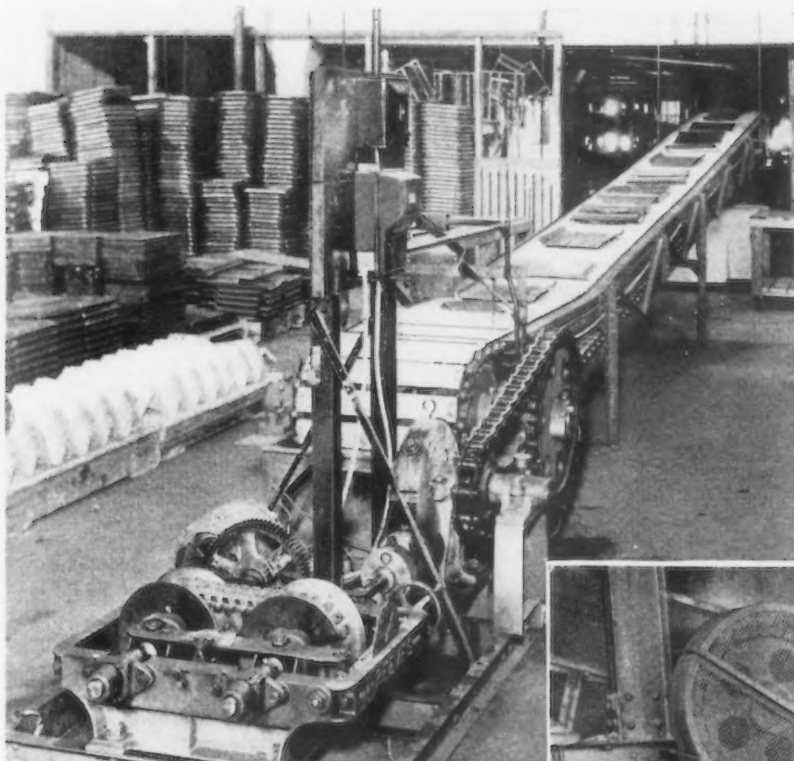
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A NEW sort of traveling crane and a new use for it. A belt conveyor runs on this traveling bridge and is placing concrete on New York's overhead roadway on West Street.

Courtesy, Manhattan Rubber Mfg. Division, Passaic, N. J.



WHERE THE DRIVE BEGINS

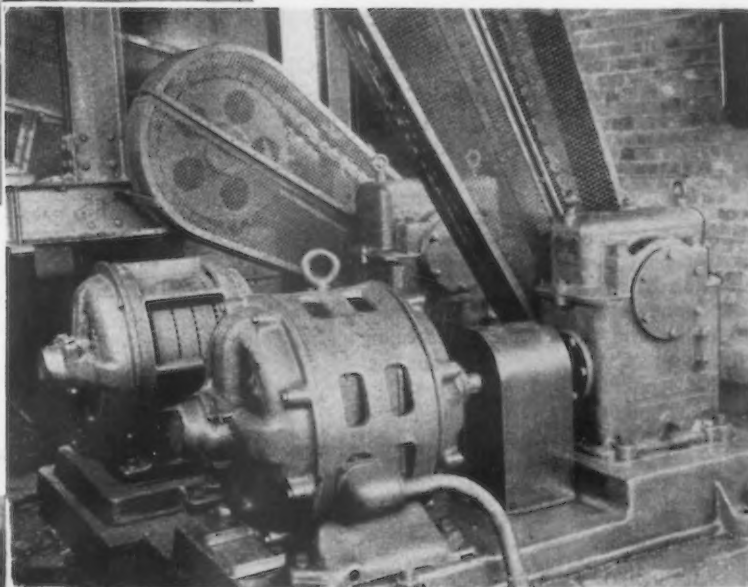


WORKING hazards are well eliminated in this driving unit of the conveyor and raw sugar elevator at the Brooklyn plant of the American Sugar Refining Co. Good practice for metal-working plants, too.

Courtesy, Cleveland Worm & Gear Co., Cleveland

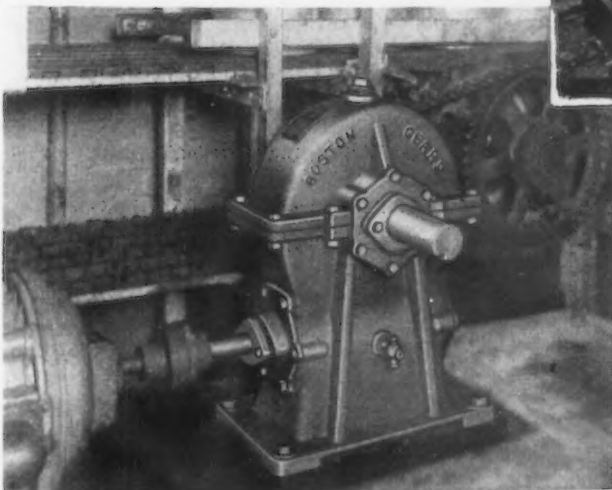
THE "business end" of a stove part conveyor operated by Standard Gas Equipment Corp., Baltimore. Note speed-changing device and speed reducer. Instant speed adjustment is essential to controlled production.

Courtesy, Webster & Weller Mfg. Co., Chicago.



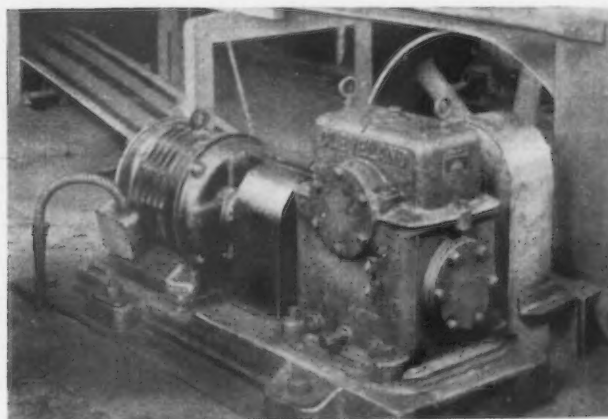
SPEED reducers are an essential part of conveyor systems. They permit the use of most effective motor and conveyor speeds without compromise. This one is driving a belt conveyor at a ratio of 20 to 1.

Courtesy, Cleveland Worm & Gear Co., Cleveland.



SPEED reducer installed as part of the drive unit for a six-chain belt conveyor. Twenty-six of these reducers have been put to work in the last two years in one of the largest dairy concerns in which this picture was taken.

Courtesy, Boston Gear Works Sales Co., North Quincy, Mass.



PROGRESS IN INSPECTION METHODS FEATURES WELDING SYMPOSIUM

ADAPTATION of the stethoscope to the examination of welds, the use of the magnetographic and weld test meter methods of inspection, and fatigue and impact testing were among the topics discussed in a symposium on welding at a regional meeting of the American Society for Testing Materials held in Pittsburgh, March 18.

Papers on inspection and testing occupied the entire afternoon session of the meeting. The morning session was devoted to papers on processes, materials and applications. Fields in which welding has undergone rapid development of late—pipe line construction and the fabrication of aluminum products—came in for particular attention.

low the surface, and is equally satisfactory in any position. It is less dependent on the experience and judgment of the user, and more quantitative than the magnetographic method. For comparing welds in the same steel, the meter can be calibrated by comparison with destructive tests to indicate roughly the efficiency of a welded joint; but in general use, because of the variations in several factors, as encountered in shop practice, its readings cannot be closely correlated with strength, and it is merely a fault finder."

Mr. Watts recommended that, whenever magnetic weld testing is employed, both the magnetographic and weld test meter methods be used if possible, as little extra work is required and each method will show certain faults that might pass without notice by the other method.

Measuring the Fatigue and Impact Values

Fatigue and impact testing on a material do not correlate until the energy of the impact below approaches a very small value, said T. M. Jasper, director of research, A. O. Smith Corp., Milwaukee, in his paper, "Fatigue and Impact Testing of Welded Products."

Fatigue testing has brought out valuable information, but as yet no one has carefully analyzed its application to engineering structures.

The fatigue test gives a good method for determining the quality of a welding process when used in connection with the development of welding and the setting of a procedure control in the welding shop, but as a method of inspection its value is much reduced by the amount of time necessary for its application, the cost and the need for men who can interpret the results of the tests.

Function of Fatigue Test

Its proper function is to discover the quality of materials for application to structures which are to be fatigued in service by the application of a relatively large range of stress which is repeated many times. It may be used as a tool to make comparisons of fabrication methods, shapes or designs and questions pertaining to the development of welding processes.

Modern Methods of Inspection and Testing of Welds

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Different experimenters, provided they have had a reasonable amount of practice in this form of testing, will check one another's results, according to Mr. Dawson, and tests to destruction after the stethoscope testing of a great many welds have shown that all defects of importance were discovered.

Another non-destructive method of testing—by means of X-ray—was outlined by Col. G. F. Jenks, who told of experiments conducted at the Watertown, Mass., Arsenal.

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"The magnetographic method is most sensitive to poor fusion, cracks,

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Stethoscopic testing of welded pipe manifold.

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Discussion

Exception to some of the author's statements was taken by John H. Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., who contended that fatigue tests of welds are only representative when they are taken across or through the actual weld.

Welding Inspection

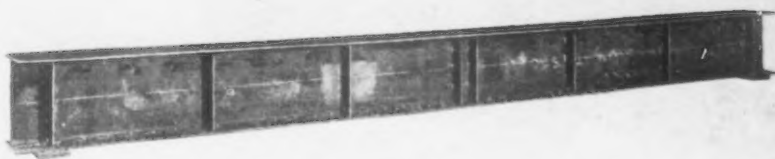
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Conclusion as to the quality can be made to some extent from the appearance of the finished welds. In case of doubt, portions of the welds are chipped out in order to verify fusion.

The quality is also insured by testing the welders periodically and assigning to each welder a stencil, which enables the identification of his work. Particular care is taken in the choice of the welding inspectors.

Testing for Oil Leaks

For vessels similar to tanks additional tests are necessary to determine if the welded joints are oil-tight. Some types of tanks are tested by gravity only, by filling them either with water, kerosene or hot oil. To other tanks, the soap and bubble test



A welded built-up girder, 15 ft. long, 14 3/4 in. deep, weighing 656 lb. It is made up of two flange plates 10 in. by 3/8 in., 16 web stiffener plates 3 in. by 1/4 in., and a web plate 14 in. by 5/16 in.

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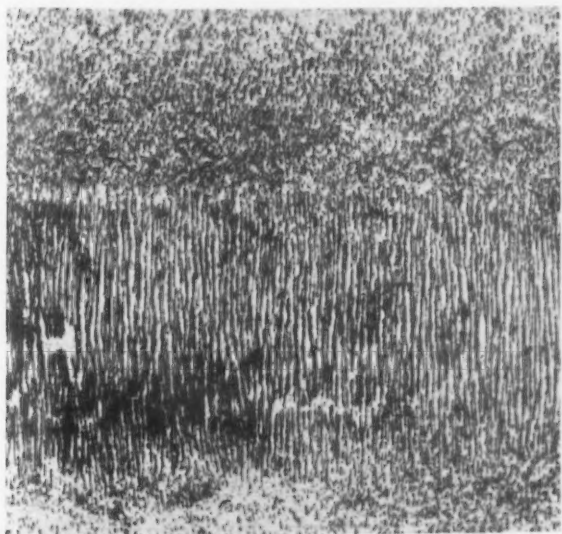
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Processes, Materials and Applications

WELDING processes, as currently carried on, were outlined by F. T. Llewellyn, United States Steel Corp., New York, in the introductory paper, "General Survey of Welding Processes." Mr. Llewellyn gave special attention to the characteristics of the newer processes as

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▲ ▲ ▲

METHOD of magnetographic inspection and of making a permanent magnetographic negative. The reproduced negative is a portion of a magnetograph of a good weld, 2 in. by 24 in. in sectional area, made by apparatus shown above.

▲ ▲ ▲

In a paper entitled, "Welding Processes Applicable to Aluminum," W. M. Dunlap, metallurgist for the research laboratories of the Aluminum Co. of America, New Kensington, Pa., explained that the fluid fusion weld, which is supplied by means of a gas torch or an electric arc, is extensively used in the aluminum industry, but that oxy-acetylene torch welds are probably best known in the industry at the present time. "Hydrogen," he said, "is preferable to acetylene for welding light material and the temperature is easier to control, the metal flows better and a clean, sound weld is obtained. An oxy-acetylene flame is usually used for welding heavy-gage sheet and plate."

Mr. Dunlap pointed out that, while

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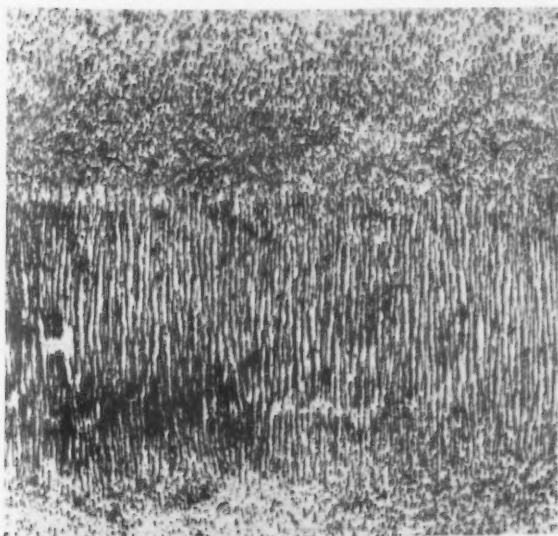
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WELDING processes, as currently carried on, were outlined by F. T. Llewellyn, United States Steel Corp., New York, in the introductory paper, "General Survey of Welding Processes." Mr. Llewellyn gave special attention to the characteristics of the newer processes as

applied to steel. The relation of the processes was shown on a chart which classified them according to function, starting with the condition of the surfaces to be welded and the source of heat. (This chart was published in *THE IRON AGE*, Jan. 8, 1931, page 171.)



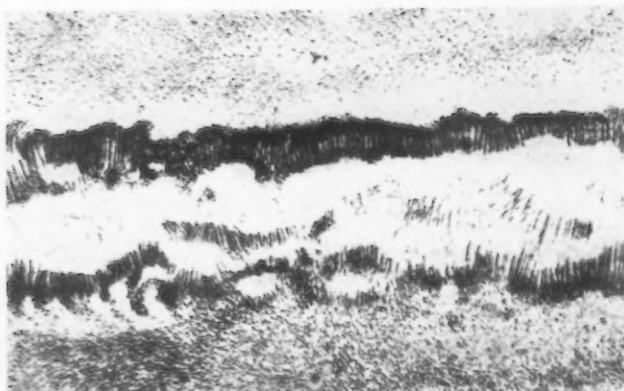
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METHOD of magnetographic inspection and of making a permanent magnetographic negative. The reproduced negative is a portion of a magnetograph of a good weld, 2 in. by 24 in. in sectional area, made by apparatus shown above.

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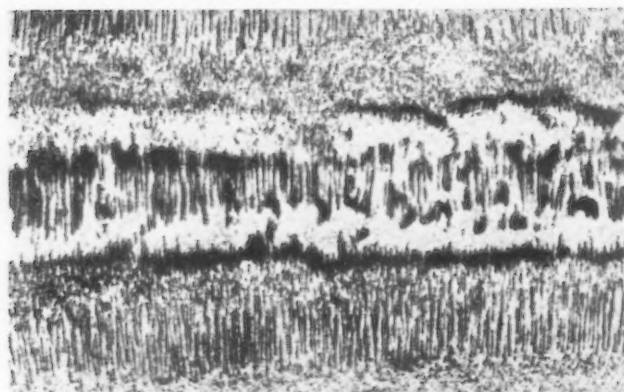
In a paper entitled, "Welding Processes Applicable to Aluminum," W. M. Dunlap, metallurgist for the research laboratories of the Aluminum Co. of America, New Kensington, Pa., explained that the fluid fusion weld, which is supplied by means of a gas torch or an electric arc, is extensively used in the aluminum industry, but that oxy-acetylene torch welds are probably best known in the industry at the present time. "Hydrogen," he said, "is preferable to acetylene for welding light material and the temperature is easier to control, the metal flows better and a clean, sound weld is obtained. An oxy-acetylene flame is usually used for welding heavy-gage sheet and plate."

Mr. Dunlap pointed out that, while



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PORTIONS of magnetographs made on test specimens with weld surface rough as welded. Bad side of weld above with good side below.



▼ ▼ ▼

the electric-arc welding of aluminum has reached a place of considerable importance, this method still has some limitations in its applications. He presented considerable data on the mechanical and physical properties of the various types of welded joints, dealing especially with work on special aluminum alloys which are finding a rapidly expanding use just now. Some of these mechanical properties are shown in the table.

Materials for Fusion Welding

The importance of first selecting the proper base metal for a particular service and then choosing the best welding rod or electrode to produce a sufficiently strong and sound weld was brought out in a paper, "Quality of Materials for Fusion Welding," by F. N. Speller and C. R. Texter, department of metallurgy and research, National Tube Co., Pittsburgh. In presenting this paper, Mr. Speller also stressed the need of selecting the best welding method for the particular job on hand, and of employing the most improved technique.

Various specifications now being followed were mentioned and a number of experiences cited by which different kinds of steel have been successfully fusion welded, with particular reference to high-carbon and special steels. Under this classification were included the rustless steels where it was shown that the problem of producing a sound weld is complicated by the necessity of maintaining the corrosion-resisting properties of

the metal. The effect of non-metallic inclusions was mentioned, as well as the possibility of the weld metal accelerating corrosion of the base metal, or vice-versa, when in contact with an electrolyte or the soil. Mr. Speller emphasized the necessity for more study of the subject.

Applications of Arc Welding

The wide variety of uses to which arc welding of steel is now being put was outlined, by means of slides, by A. M. Candy, welding engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, in a paper, "Modern Applications of Arc Welding."

The use of electric arc welding has come into great prominence in the manufacture of machinery and the construction of buildings, bridges and similar structural steel frames during the past four years, Mr. Candy pointed out. All of this work has been the result of thorough tests and

careful designs worked out by competent engineers who understood the advantages and limitations of the welding process.

To reap the maximum advantage of the welding process, he explained, it is necessary to follow practices differing in many respects from those to which designers are accustomed. He mentioned major features which must be considered by engineers who desire to make a success of the substitution of welding and welded designs for riveted construction, as well as welding and welded designs for the replacement of castings used in the manufacture of machines and machinery.

Discussion

Exception to certain statements made in Mr. Candy's paper were taken by J. J. Baum, development engineer, the Steel Founders' Society of America, New York. Mr. Baum's contention was that welded structural units are not necessarily cheaper and more efficient than the equivalent steel casting. He also denied the necessity for extensive machining operations on castings, which was stressed in the paper. Several other exceptions were taken to the paper, notably with respect to the comparative homogeneity of metal in castings as compared with built-up structural members, the speed of making deliveries, pattern storage charges, scrapping of castings due to blow holes, and relative cost of repairs to machinery.

Welding Manganese Steel

In further discussion of the same paper, J. H. Hall, technical adviser to the president, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., told of the difficulties encountered in the welding of manganese steel. To overcome these, Mr. Hall explained that the Taylor-Wharton company had developed a new manganese welding rod containing approximately 13 per cent manganese, 3 per cent nickel and 0.80 per cent carbon. This material has proved very valuable in rail and track installations, and lends itself to repairs much more readily. By means of photomicrographs on the screen, Mr. Hall showed the superior structure of welds made with this new rod, as compared with those formerly possible. He considers successful welding of high-manganese steel now possible.

Mechanical Properties of Welded Joints in Aluminum

Metal	B. & S. Gage	Type of Weld	Tensile Strength, Lb. per Sq. In.	Elongation in 2 In., Per Cent
2S	No. 16	Torch	14,235	35.0
2S	No. 8	Torch	15,295	35.0
2S	No. 0	Torch	11,670	46.0
3S	No. 3	Metallic Arc	16,805	14.0
17ST	No. 10	Metallic Arc	36,155	3.0
51SW	No. 10	Metallic Arc	29,375	5.0
51SW	No. 16	Carbon Arc	31,000	13.0
51SW	No. 10	Carbon Arc	32,400	6.0
25ST	No. 16	Carbon Arc	43,385	7.0
Alclad 17ST	No. 16	Carbon Arc	39,000	3.0

Gas welding has received great impetus in the last year from the laying of extensive pipe lines for the transportation of gas, oil and gasoline, according to a paper entitled, "Recent Developments in Gas Welding and Cutting," by E. J. W. Eggers, development engineer, Linde Air Products Co., Pittsburgh. For this work new welding rods have been developed which have greater strength and higher speed on thin-walled material than ever before was possible. The use of liners at the pipe joints has contributed much to the efficiency of this type of work, as they enable complete fusion to be assured, particularly on large diameter pipe.

Oxy-acetylene welding, Mr. Eggers

stated, is also being used more broadly in the welding of cast iron pipe lines, and here bronze welding has been found most efficient. End plates are used in this type of work, and the ends of the pipe are quite often made slightly thicker in order to secure stronger joints.

Mr. Eggers also outlined the use of gas welding in the pumping and heating industry, and the aircraft building group. In the latter field, recent research activities on the part of the Government have been very helpful. Further application of gas welding to chrome-nickel steels, aluminum and its alloys, and brass and bronze products was covered by Mr. Eggers' paper.

Safety Device for Power Presses

REFINEMENTS intended to make for greater ease of operation and adjustment feature the improved model of the Possons positive safety device for power presses recently announced by the Positive Safety Mfg. Co., Cleveland. These refinements, incorporated in both floor and ceiling attached guards, include visible cord and cable assembly bringing all working parts into plain view; adjustable ram-connection operating from below any possible breaking point; and a

frame attachment adjustable to both the upright and inclined position of the press.

Working parts have been strengthened and maintenance made more simple. The special hand-strap that attaches to the operator's wrist and passes under his thumb is connected by a quick-release safety clip to flexible cables. These pull-back cables extend upward through tubes supported on brackets attached to the main column, and are attached to a

slide that operates up and down with the stroke of the press. A steel cable attaches the slide to a rocker arm connecting to the ram of the press.

In operation, the ram on its downward stroke pulls back the cables and removes the operator's hands from the danger zone. Adjustment of the pull-back may be made for any press operation. The amount of free cable, the distance of pull-back, and the speed of withdrawal may be set to suit the job and the apparatus may then be locked in adjustment by the foreman. There is nothing to interfere with the handling of the work, freedom of operation being allowed in every direction. Either side or the floor can be reached with ease.

A pull out multiplier has been designed as optional equipment for use on short-stroke presses or for jobs which require a quick withdrawal. It is geared so that from 3 to 5 in. of pull-out is allowed on the first $\frac{1}{2}$ in. of the downward stroke of the ram. A rack on the connecting rod engages with a cam and pinion mechanism. The acceleration of pull-out results from the winding of the cable on the cam.

Government Takes "Movie" of Steel Manufacture

"The Story of Steel," from the mining of ore to the manufacture of finished steel products, is depicted in a series of educational motion pictures released for free circulation by the United States Bureau of Mines, Department of Commerce. These motion pictures, which constitute a notable addition to the bureau's extensive collection of films, have resulted from extensive revision of a picture prepared some years ago.

Film 143, two reels, "Mining and Metallurgy," shows the geographical and geological location of the ore deposits; transportation of ore from mine to blast furnace by boat and railway; reduction of the ore in the blast furnace to pig iron or molten iron for further processing, and the pouring of ingots. It also shows the making of coke in by-product ovens. Film 144, one reel, "Rails, Rods and Plates," shows the method of making these and other hot-rolled products from the ingots. Film 145, one reel, is titled "Wire Products." Film 146, one reel, is "The Manufacture of Pipe." Film 147, one reel, bears the title "Sheets and Tin Plate."

Copies of these films may be obtained for exhibition purposes by schools, churches, clubs, civic and business organizations and others interested by applying to the Pittsburgh Experiment Station, United States Bureau of Mines, Pittsburgh. No charge is made for the use of the film.





Full-Revolving Convertible Excavator Features Simple Construction

THE Wright excavator, a convertible, full-revolving, $\frac{1}{2}$ -yd. shovel equipped with two drums and boom hoist to handle any kind of shovel or crane work, has been placed on the market by the Pontiac Tractor Co., Pontiac, Mich. Simple, as well as sturdy, construction is a feature, the machine having less than the usual number of parts. All castings are of heat-treated alloy steel.

The excavator is mounted on a McCormick Deering Model 20 industrial tractor. The hoist mechanism is driven from a chrome-nickel shaft, mounted on four brackets with Hyatt roller bearings. This shaft is substituted for the rear axle and differential of the tractor. The drive is through an inclosed transmission having hardened steel gears.

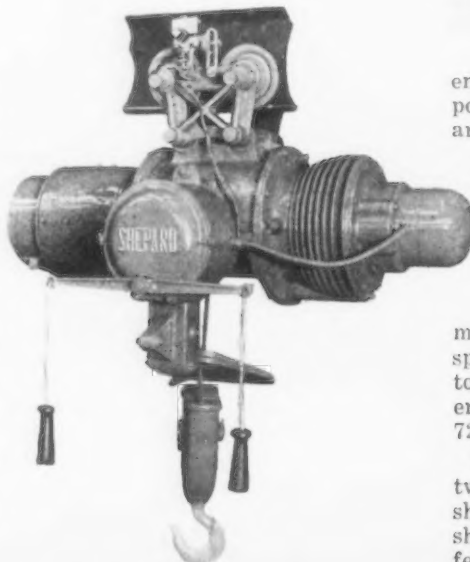
Roller bearings are employed on all shafts operating at 20 r.p.m. or more. The heavy-duty plain bearings are lubricated by a force feed system. The drum clutches are of the twin disk type and the beveled swinging gears are driven through self-energizing cone clutches on the cross shaft. Raybestos clutch lining is used. An index latch is provided to prevent the machine from rotating whenever the traction gears are engaged. Traction is through two steel gears on the cross shafts which mesh with gears on a stub shaft between the main frame and the caterpillar.

The shovel boom is 16 ft. and the dipper handle $10\frac{1}{2}$ ft., in length. The trench hoe or clam and dragline can be attached in the field without removing the main boom. Crane booms,

30, 35 and 40 ft. in length may be used. The maximum shovel dumping height of the excavator is 14 ft. The machine weighs 28,000 lb.

Compact Hoist with Interchangeable Parts

A RECENT development by the Shepard, Niles Crane & Hoist Corp., Montour Falls, N. Y., is a compact hoist of sectionalized con-



struction which can be put under large-scale production in manufacture of interchangeable parts. Using the same body and attaching different motor and gear-end sections, varying requirements of speed or capacity can be met.

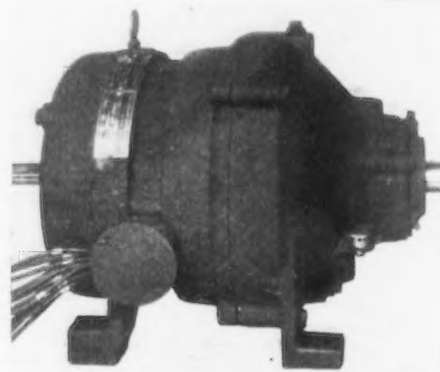
Motors for these hoists are designed to meet hoisting requirements without exceeding 50 deg. C. temperature rise in 30 min. Cooling fins are cast integral with the gear-end section inclosure. These provide sufficient radiation area to insure cool operation of the brake under the most adverse load conditions.

All moving parts in the gear end operate in an oil bath. The gears are of heat-treated steel. The load block is inclosed completely, except on the type providing close clearance.

Ball-bearing trolley wheels are provided for the push type of trolley, to ease its operation along the runway beam. Balanced drive through the use of planetary gearing maintains alignment and is said to reduce bearing pressures materially.

Reducer Provides Two Speeds

MOTORIZED speed reducers manufactured by the Production Equipment Co., Cleveland, are now available with driving shafts at each



end. The equipment comprises a polyphase induction motor of standard or special characteristics and reduction gearing of the spur, helical, planetary or bevel type in an oil-tight housing that forms a unit integral with the motor frame.

The slow-speed shaft, shown at the right in the illustration, may be designed for operation at any speed from 20 to 875 r.p.m. The motor shaft extension at the opposite end operates at the motor speeds of 720, 900, 1200 or 1800 r.p.m.

The unit can also be equipped with two speed reducers providing slow shaft speeds at each end. These shaft speeds may be the same or different, as required.



Diesel Locomotives for Industrial Plant Switching Service

TWO Diesel locomotives especially adapted for economical switching service in industrial plants have been brought out by the Fate-Root-Heath Co., Plymouth, Ohio. The locomotives are made in 14 and 30-ton sizes, designated as the Model JLD and WLB, respectively.

The 14-ton locomotive illustrated is powered by a Buda M.A.N. four-cylinder Diesel engine; the larger locomotive, the 30-ton size, is driven by a

six-cylinder engine of the same make.

The wheelbase of the smaller locomotive is short and the spring suspension is flexible and cross equalized to promote easy riding on rough tracks. The 30-ton model is equipped with six-wheel drive and fully equalized spring suspension, permitting its use on light rough tracks. Both models have full size steel cabs, high and wide enough to give the operator vision over and around the cars.

Gas-Operated Crane for Inside and Outdoor Work

A STURDY, variable-height mobile crane has been brought out by the Clark Trutractor Co., Battle Creek, Mich. This has capacity to lift 2000 lb. to 13 ft. and yet, when the

boom is horizontal, the entire equipment has an overall height of but 7 ft. 10 in., making it easy to negotiate plant and warehouse doors. The movable crane has important advantages



over the fixed crane for certain types of work.

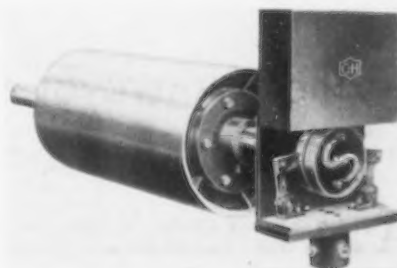
This "Clarktor" unit is said to have shown notable economies in such work as placing heavy castings and forgings on drill presses, lathes and other machine tools and in handling heavy parts and machines in storage. It is especially useful in handling heavy crates, bundles, boxes and other loads requiring chains or hooks. It tiers such loads easily.

The chassis is the rugged "Clarktor" tructractor, which has the short turning radius of 108 in. Standard truck transmission, Clark truck axle and multiple disk clutch are fitted. Equipment includes self-starter, generator, battery, head and tail lights.

The tractor-type gas engine used consumes five or six gal. of gasoline and a pint of oil daily, making operating costs low. Gas power makes the job capable of 24-hr. continuous operation.

A New Magnetic Separator Pulley

SIMPLE construction, better wearing qualities and lower price are features claimed for a new type "W" magnetic separator pulley made by Cutler-Hammer, Inc., Milwaukee. The new pulley has only three major parts—a machined cast steel spool, the

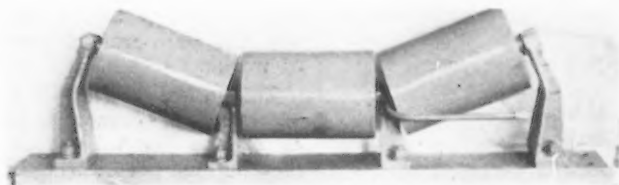


magnet coils and a coil shield—with the necessary insulation.

After the magnet coils are wound on the steel spool they are vacuum impregnated to make them moisture proof. The coil shield is then welded to the spool so that it completely incloses the coils. This coil shield is of Allegheny metal, which provides a tough, long-wearing, non-magnetic pulley surface.

Commutating mechanism, which conducts the current to the magnet coils, is mounted on one end of the pulley shaft. Heavy brass collector rings and carbon brushes assure good contact. A dust-proof cover protects the commutating mechanism from dust and other flying particles, and protects operators from accidental contact with live parts. The illustration shows the dust-proof cover in the raised position.

These new magnetic separator pulleys are made in 12-in. diameter size and in six lengths, for belt widths varying from 12 to 30 in.



Conveyor Idlers Have Timken Bearings and Steel Pulley Shells

A SERIES of conveyor belt troughing and return idlers equipped with Timken roller bearings has been brought out by the C. O. Bartlett & Snow Co., Cleveland. The bearings of each pulley are provided with a positive screw adjustment so arranged that wear may be taken up without removing the pulley from the supporting brackets.

Provision is made for renewing the pulley shells without destroying the pulley ends, which are made of cast iron. These renewable shells are made from seamless steel tubing, $\frac{3}{4}$ in. thick and 6 in. in diameter. The use of uniform tubing results in a well balanced pulley, said to reduce belt wear by virtually eliminating slippage over the pulley.

Four brackets, mounted on an inverted steel channel, support the three pulleys of the troughing idler which provide a continuous support

across the belt except for a $\frac{1}{4}$ -in. gap between pulleys. Open tops in the brackets permit any pulley to be removed without disturbing the bracket or adjacent pulley. The single pulley of the return idler is similar to the pulleys of the troughing idler; its brackets, however, are of the hanging type.

A single grease fitting serves to lubricate the two bearings of each pulley in the troughing idlers. The longer return idler pulley has a fitting for lubrication at each end. A central tube prevents the escape of grease into the pulley interior. As the flow of grease is toward the outside, the bearings are flushed as they are greased. The bearings are further protected by four-pass metal labyrinth seals.

The Series 40 troughing and return idlers are offered in nine sizes for belt widths ranging from 18 to 60 in.

knurling on the axle of the conveyor. This lock altogether eliminates the turning of bearing on the axle.

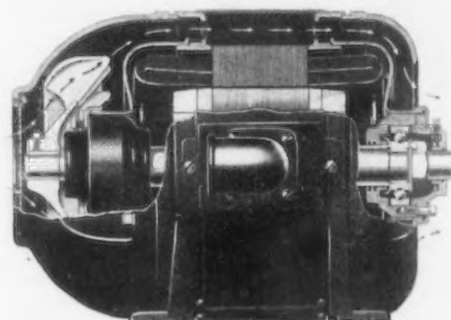
Clogging of the conveyor is eliminated by protecting all bearings with a special steel-and-felt washer labyrinth, which effectively excludes all dust, dirt, grit, etc. These bearings can be packed with grease or furnished with lubrication fittings if especially heavy duty is anticipated.

Another feature is the unusual key-lock axle. One end of the axle is provided with an upset key, fitting into a corresponding slot in the frame rail. This prevents the axle from turning. The opposite end of the axle has standard cotter keylock. Axle can be easily removed from the frame.

Other parts of the machine are typical of Mathews construction. Extra rugged frames, rollers of 0.40 per cent carbon seamless tubing, and heavy cones and races all contribute to the sturdiness of the new unit.

Inclosed Fan-Cooled Motor

A NEW line of dust-tight, totally inclosed fan-cooled induction motors is being put out by the General Electric Co. These motors are

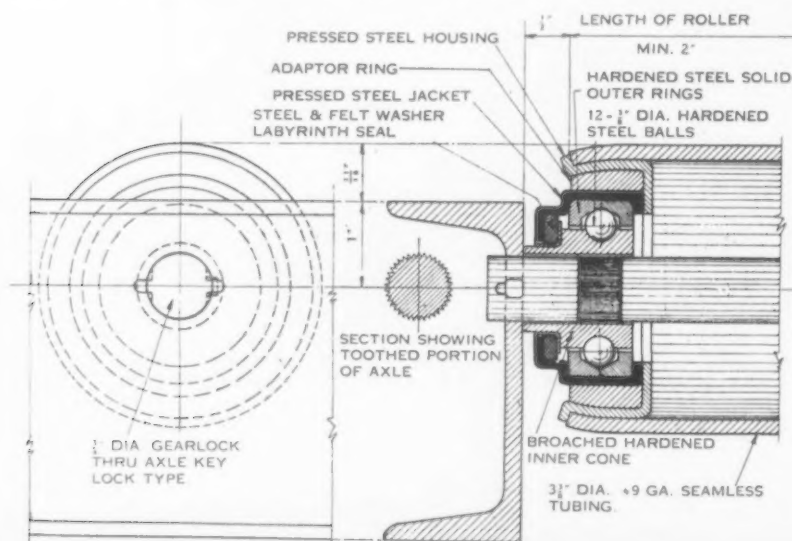


Roller Conveyor with New Gearlock and Keylock

A NEW heavy-duty roller conveyor for foundries and other plants where extremely heavy service is encountered, has been developed by Mathews Conveyor Co., Ellwood City, Pa. The new unit is

said to incorporate features not heretofore found in industrial conveyor systems.

Featured in the new model is a unique gearlock made possible through gear teeth inside of the cone and



Cross-section of roller unit, showing the gearlock and keylock features.

equipped with ball bearings, in convenient "cartridge" housings, and utilize a single ventilating fan outside the inclosure proper. They were first exhibited at a convention in Atlantic City, Sept. 22 to 26, 1930.

A point stressed by the manufacturer is the fact that the new line provides a totally inclosed motor of the same mounting dimensions, rating for rating, as its standard open-type, horizontal, general purpose motor, from $\frac{3}{4}$ to 50 hp., in popular speeds.

Size and weight are minimized in the new motors. The ventilating fan is located on a short shaft extension, and on the end opposite the drive end. A double frame is used, providing air passages for the ventilating air. All inclosing parts are of substantial steel or cast iron construction. The fan is housed in a cast iron inclosure with a heavy screen guarding the large intake opening. The air is

blown through the ventilation passages and out at the drive end.

Any necessary disassembly or re-assembly of the motor is facilitated by the simplified mechanical construction. Dust-tight, cartridge-type ball bearing housings permit removal of the rotor without exposing the bear-

ings to dust or dirt. The motor is indorsed by the Underwriters' Laboratories for hazardous dust conditions, specified as Class 2 in the National Electric Code, and may be obtained with the Underwriters' label indicating its suitability for such conditions.

Ball Bearings Increase Efficiency of Lifting Machines

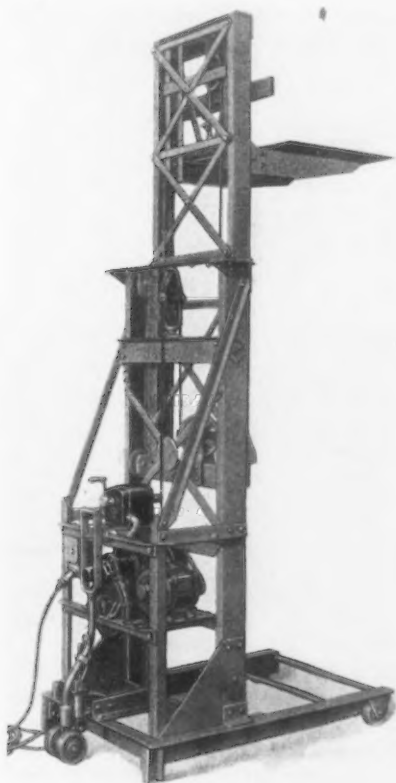
THE Economy Engineering Co., 2653 West Van Buren Street, Chicago, has announced a new line of ball-bearing lifting machines, comprising both hand and power oper-

ever, the increase in efficiency is employed to provide a proportionately faster travel of the platform.

The hoisting units are of the spur-gear type, that of the hand power machine being fully guarded and lubricated with grease. The electric

gear unit is contained in a metal case and runs in a bath of oil. The former has a self-acting gravity brake, while the latter has a dual system, both brakes working automatically to hold the load wherever desired and to prevent falling of the platform in case of current failure.

The electric machines are equipped with high torque motors of $\frac{1}{2}$, 1, 2, 3 hp. or more as determined by the required speed of operation. Unless otherwise specified, the motor control is a single lever drum switch. A lever attached to the rear of the controller shaft operates the service brake. Automatic limit stops prevent overtravel of platform by returning control lever to the "stop" position, thereby stopping the motor and setting the brake. Lubrication of the guide, sheave and base wheels as well as the hand power hoisting unit is by the Alemite system.



The Economy motor-driven telescoping lifter equipped with automatic limit stops.

ated, plain and telescoping machines. The electrically driven machine illustrated is of the telescoping type.

Ball bearings are used throughout the gearing and in the sheave, and platform frame wheels. The sliding frame wheels of the telescopers are also ball-bearing equipped. Friction is further reduced through flangeless guide wheels which are used to support the platform and telescoping frames.

These two features are said to make possible a 25 per cent increase in operating efficiency. In the new hand-power type only 25 lb. cranking pressure is required to lift the rated load. In the electric models, how-

Hard Surfacing Material Prolongs Life of Matte Ladles

LADLES used to transport copper matte during the smelting process are subjected to considerable wear. The matte is an impure sulphide, the product of the first process of smelting certain copper ores. Frequently holes are burned or expansion cracks develop in the large ladles used to transport the matte from the roasting furnaces to the refining equipment.

For some time welding has been used to repair the damage, but the results have not been completely satisfactory. High-carbon welding metal deposited in the fractures was frequently eaten away by the matte and patch repairs of burned spots have failed soon after the ladles have been put back into service.

Repairs, hard surfaced with Hascrome, a chrome-manganese-iron alloy, have proved successful, according to the Haynes Stellite Co., 205 East Forty-second Street, New York. In a Southwestern smelting plant, patches and crack repairs surfaced with this material have stood up

longer than the base metal of the ladle itself.

In repairing cracks with this alloy, the edges of the break are cut to a V-shape both inside and outside. The outside of the ladle is then welded, using an ordinary high-carbon welding rod, and the inside is built up with the same material to within $\frac{1}{4}$ in. of the surface. The hard surfacing material is used in completing the weld on the inside. It also is recommended that reinforcing straps be welded on the outer surface of the ladle across the joint. The illustration shows a weld of this type in which the 4 x 10-in. reinforcing strips were cut from $\frac{3}{4}$ -in. plate.

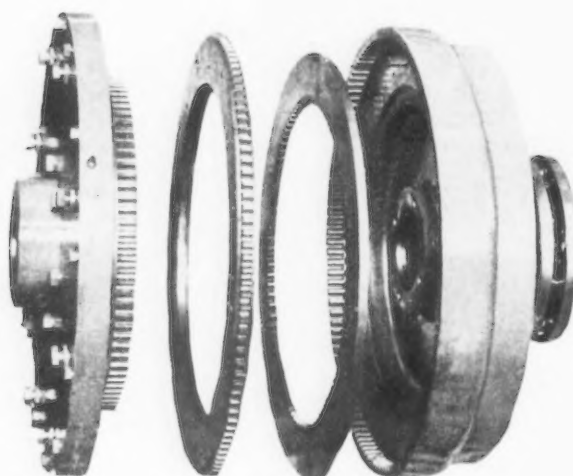
Holes burned through the sides of a ladle may be repaired by means of a patch cut from an old ladle. The weld is made in the same manner as for crack repairs.

It is suggested that the life of ladles might be prolonged by coating the entire inside of the pot with a self-hardening alloy.

HASCROME hard surfacing was used in repairing this ladle for copper matte service. Reinforcing straps are welded on the outside.



FRICTION surfaces on the driving rings of this magnetic clutch promote smooth operation.



Offers Multiple-Disk Magnetic Clutch

MMAGNETIC Mfg. Co., Milwaukee, manufacturer of Stearns magnetic equipment, has developed a multiple-disk magnetic clutch which combines ease of operation and smooth acceleration. Maximum horsepower and increased pull-out torque are said to be obtained; a typical clutch of this type, which measures 24 in. in diameter, is claimed to develop a pull-out

torque of more than 6500 ft. lb.

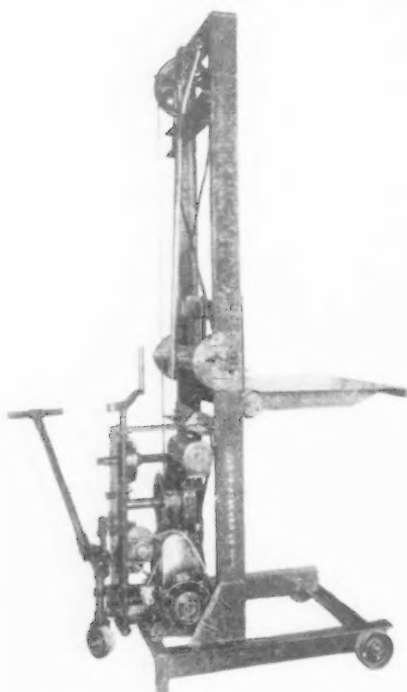
As shown in the illustration, there are three friction rings, one in the clutch body at the right and the other two on the external and internal driving rings. The ample surface of friction lining provided is said to assure long life and to keep the pressure per square inch low enough to obtain the desired amount of slippage.

Tiering Stacker Has Gasoline Power

A COMBINATION gas-engine-driven and hand-power stacker has been added by the Lewis-Shepard Co., Boston, to its line of lifting equipment. This machine is operated by a compact 2½ to 3-hp. air-cooled

four-cycle engine, and will lift a 1000-lb. load at the rate of 40 ft. a minute.

A decelerator control prevents undue speed when lowering the load. The stacker is of special value in providing suitable means of tiering and storing material, so that floor space is saved and excessive handling eliminated. The gasoline motor removes restrictions imposed by electric lines or their absence.



A gas engine serves to hoist the load readily in places where electric power is not accessible.

Medium-Manganese Steel Standard Sample

The United States Bureau of Standards has prepared a standard sample of medium-manganese steel of the following composition:

	Per Cent
Carbon	0.618
Manganese	1.39
Phosphorus	0.023
Sulphur	0.021
Silicon	0.192
Copper	0.123
Nickel	0.151
Chromium	0.189
Vanadium	0.012

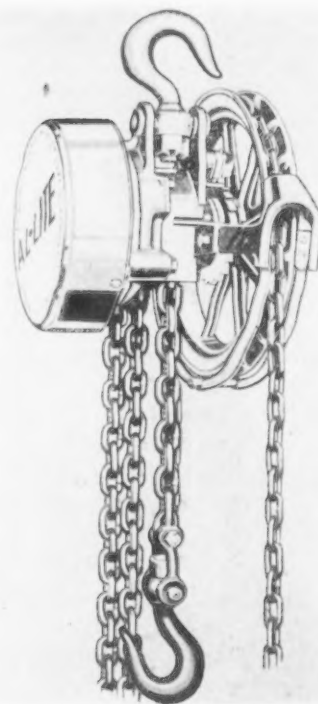
This standard is No. 100 in the series and costs \$2 per sample of 150 grams. The sample may be paid for in advance with the order or be sent parcel post c.o.d. in the United States

and its possessions. All foreign shipments require prepayment together with 20c. additional postage.

Aluminum Alloys Used in New Chain Hoist

THE "Al-Lite" hoist illustrated, described as the first chain hoist to be made of aluminum alloys, is being placed on the market by the Chisholm-Moore Hoist Corp., Tonawanda, N. Y.

One man can lift and carry the new hoist, which is one-third lighter than similar equipment made of heavier metals. Strength as well as light-



ness is obtained, the hoists being tested under a 50 per cent overload.

The planetary reduction gears of the Al-Lite hoist are inclosed in a dustproof housing. "Inswell" chain is supplied. Other features include ball bearings, Alemite lubrication, and an adjustable brake which is secure and positive in action. The hoist is finished in bright aluminum and will not corrode. It will be shown at the second National Industrial Exposition, Cleveland, April 13 to 18.

Wrenches made of Crestoloy steel, for which is claimed unusual hardness, strength and toughness, have been placed on the market by the Crescent Tool Co., Jamestown, N. Y. Although much thinner, lighter and easier to handle than the company's regular wrench of the same type, the new wrench will withstand more than twice the strain. Crestoloy is the trade marked name of a new steel developed by the company.



ATTENTION, WORKS MANAGERS!

MONEY spent for carefare to Cleveland next week should be a good investment. At the second National Industrial Congress and Exposition, one may pick up some good cost-saving ideas. Latest methods and equipment will be demonstrated from April 13 to 17. Of course, you read all about such developments in **THE IRON AGE**, but there is satisfaction in seeing these notable industrial actors in the "flesh."

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SEVEN HUNDRED YANKEES CAN'T BE WRONG

SEVEN hundred thirty-nine New England business executives, speaking through the New England Council, make recommendations for 1931 industrial program. Majority believe that the first essential is to "hold lay-offs to a minimum by spreading work, reducing hours, if necessary." Next in importance is aggressive merchandising planned through analyses of past sales, customers and territories.

Good advice can be expected from New England, daddy of American industry. The recommendations of the council, printed at length elsewhere in this issue, are worthy of study by industry at large.

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MACHINERY POPULAR ABROAD

DESPITE continued slackening in our total exports, February marked the fourth consecutive month of increase of exports in machinery. Pretty conclusive evidence that world slump has not impaired faith abroad in labor-

saving machinery. Also, might be a hint to makers of improved machinery to cultivate export markets.

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STEEL CONSTRUCTION CLIMBING

ACCORDING to Charles N. Fitts, president, American Institute of Steel Construction, in a statement to Col. Arthur Woods, present rate of gains in steel construction, if continued, will bring member firms back to normal early this summer. Tonnage lettings during the past three months have been greater than for same period in 1930.

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LET SWITCHING RATES ALONE

SO say steel company traffic managers at April 1 hearing in Pittsburgh on short-haul rate reductions. High rates on short-hauls have already been suspended by State commissions in Illinois, Indiana and Pennsylvania. Steel companies in Ohio, West Virginia and New York believe that relief can be obtained for them in similar manner without increasing charges in switching districts. Latter, it is feared, would disturb long standing freight relationships seriously.

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RAILROADS AFTER TRUCK BUSINESS

TURN about is fair play! For a long time the motor trucks have been taking business away from the railroads, especially in the transportation of finished motor cars. Now the railroads are hitting back. On April 20, they will effect reductions in

freight rates on finished motor cars ranging from 11 to 50 per cent. Largest decreases will be on the short hauls. Next move will be up to the truckers.

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MEDIUM-PRICE CARS GAIN GROUND

REPORT of the National Automobile Chamber of Commerce shows 26 per cent gain in March over February. Most of the gain was in the medium-price classes. Ford and Chevrolet volumes were off a bit. Thus, the dollar volume gain was even larger.

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PAY ENVELOPES FATTER IN FEBRUARY

METAL-WORKING plants which report to the United States Bureau of Labor Statistics show increase in working hours and total wages for February. Iron and steel establishments show 0.4 per cent increase in employees and 10.5 per cent increase in total wages. This helps purchasing power.

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BIG BUSINESS "PROPOSITIONS"

A NUMBER of large construction projects, not in the Amos and Andy class, but involving real money, appear in the week's news. "Here they are."

Northern States Power Co., Minneapolis, has arranged for bond issue of \$35,000,000. Part of this will be used for expansion of Riverside steam-electric plant.

Arkansas Natural Gas Corp. has let contract to Ford, Bacon & Davis, Inc., of New York, for \$800,000 natural gas pipe line

from Longview, Texas, to Shreveport, La.

Chicago, Rock Island & Pacific Railroad Co. will build \$4,200,000 addition to grain elevator at Kansas City, Mo.

New York Central Railroad Co. will spend \$700,000 building and equipping storage and distributing building in New York City.

Port of New York Authority awarded contract involving \$855,000 for excavations and foundations for new union freight, storage and distributing terminal. Will cost \$15,000,000 to complete.

Consolidated Gas Co., New York, will spend \$500,000 for new distributing plant in New York.

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MARCH INGOT OUTPUT UP

OPEN-HEARTH and Bessemer ingot production for March shows 20 per cent total gain over

February and 10 per cent gain in daily average. Monthly production passes the 3,000,000-ton mark for the first time since last August.

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HIGH-SPEED VERSUS CARBON STEEL TOOLS

CENSUS Bureau, for the first time, has issued a breakdown of accessory and small tool production in United States, reported in detail elsewhere in this issue.

Figures published in this report should effectively squash the idea that carbon steel cutting tools are "on the way out." Total dollar volume for 1929 production of high-speed drills, lathe tools, milling cutters, reamers, taps and dies was approximately \$30,000,000 against \$13,000,000 for carbon steel. Excluding milling cutters, where high-speed exceeds carbon steel in the ratio of 20 to 1, the

totals were for high-speed steel tools, approximately \$20,000,000; for carbon steel, \$12,500,000. Making allowance for the extra cost of high-speed steel tools, it will be noted that a large number of carbon steel tools are still being sold.

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MORE IRON AND STEEL CAPACITY

DESPITE "overproduction" in 1930, iron and steel producers gave evidence of belief in future growth of industry by spending money for plant expansion. American Iron and Steel Institute figures for 1930 show 2 per cent increase in pig iron capacity, 10 per cent increase in blast furnace capacity for ferroalloys and 6 per cent in steel ingot capacity. Large percentage gain for ferroalloys anticipates trend in machine design toward more extensive use of alloy steels.

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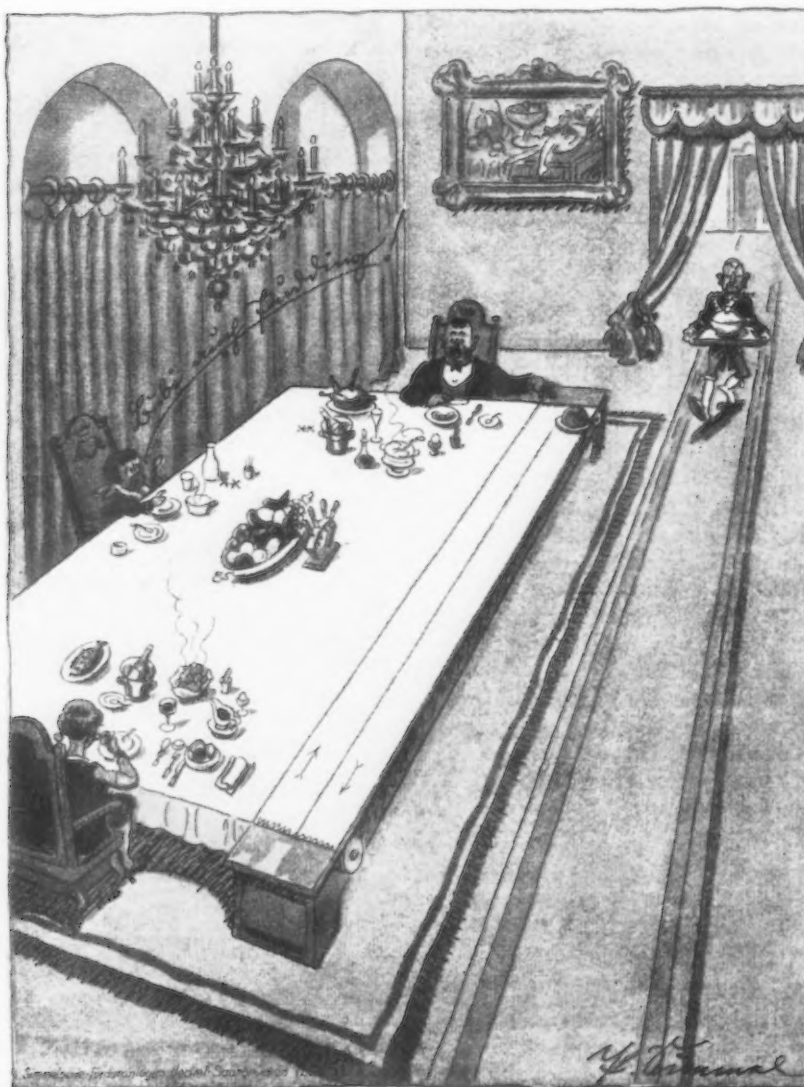
Urges Concerted Move to Recapture World Trade

"Concerted action among American manufacturers is needed to bring about a revival of our export trade," says Frank R. Eldridge, executive vice-president of the American Manufacturers' Export Association, 401 Broadway, New York. "This should naturally follow the plans to distribute, through long-time loans, the world's supply of capital now congested and idle in New York and Paris. With available capital for productive enterprises in the principal markets of the world, the demands for our equipment and supplies will multiply."

The American Manufacturers' Export Association, comprising 900 leading companies in this country, is inaugurating such a concerted movement, says Mr. Eldridge. It acquaints foreign buyers with American products through distribution of a register of American exporters to 50,000 buyers in 147 foreign countries. Listing is free, although confined to the products of the members of the association.

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Bell bottom screw jack simplified practice recommendations, which have been instrumental in reducing the number of sizes of jacks manufactured and cataloged from 78 to 38, are now available in pamphlet form from the Superintendent of Documents, Government Printing Office, Washington. The price is 5c. each.



"Look out, Alice, I'm sending over the pudding." A German idea of the use of conveyors in the dining hall. From a cartoon drawn for the Förderanlagen Ernst Heckel, G.m.b.H., Saarbrücken.

New England Industry Adopts Working Program for 1931

Urges Holding Lay-Offs to Minimum, Aggressive Merchandising and Other Constructive Steps

A WORKING program for New England industry in 1931 consisting of 14 recommendations made by 739 leading New England business executives has been issued by the industrial committee of the New England Council.

Hundreds of New England business executives were asked to recommend the steps which, in their opinion, should be included in a practical and ideal working program for any New England industry during the present year. Replies were received from manufacturers, public utilities, railroads, department stores, hotels, insurance companies, trade associations, chambers of commerce, communities, newspapers, business publications, State governments, and members of the New England Council. The replies were analyzed and the results compiled by the council, and the program made up from these results consists of 14 points arranged in order of their importance as shown by the number of executives recommending them.

The first recommendation which was made by 534 executives is to "hold lay-offs to a minimum" by eliminating overtime and then, if necessary, by reducing weekly hours. It is better to provide half-time work for the full force than to provide full-time work for half the force and allow the other half to become unemployed, according to the executives.

Aggressive merchandising is urged by 501 executives, and constitutes the

second recommendation. Under this heading, it is suggested that past sales be analyzed for the most profitable lines, customers and territories, and that selling efforts be concentrated on them. Improved quality, better packaging, the development of new uses for present products and of new products to meet new conditions, are among the steps included in this recommendation.

"Improve employee morale" 448 executives declared in their ballots. This, it was suggested, could be done by keeping employees informed regarding the progress of the company's efforts for the maintenance of steady work for them, and maintaining wages and working conditions on a level that enables the employee to prosper as well in New England as elsewhere. Constant effort to improve human relations within the organization was urged by these executives.

Repair Work Recommended

Other recommendations include those to encourage normal buying for normal needs by those with a steady income, to clean up, paint, repair and do general "house cleaning," to overhaul machinery and equipment, to adopt research, to develop plant modernization programs, to invite employees' suggestions as to the elimination of waste, to plan and budget profits, sales and production, to establish adequate standards of quality, value, and performance, with suitable

incentives and rewards for attainment and maintenance; to cooperate with the community in registration of unemployed with regard to relative need for work, to encourage accurate local publicity on local business conditions and the extent of employment as the first step in maintaining confidence in local industries and to encourage exchange of information between New England communities on opportunities for work in order to avoid excessive and unwarranted travel expenditure by labor "hunting jobs."

The program has been distributed by the council to more than 5000 New England manufacturers and to several thousand other business men and executives. The program emphasizes the statement that "some recommendations apply to all industries, all recommendations apply to some industry. All remain recommendations until business executives make them realities."

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Fabricated Plate Orders Declined in February

WASHINGTON, April 7.—Orders for fabricated steel plate in February amounted to 22,699 tons, compared with 26,308 tons in January, according to reports received from the Bureau of the Census from 51 manufacturers. The February orders were distributed as follows: Oil storage tanks, 3585 tons; refinery materials and equipment, 2536 tons; tank cars, 653 tons; gas holders, 1344 tons; blast furnaces, 75 tons; miscellaneous, 14,506 tons.

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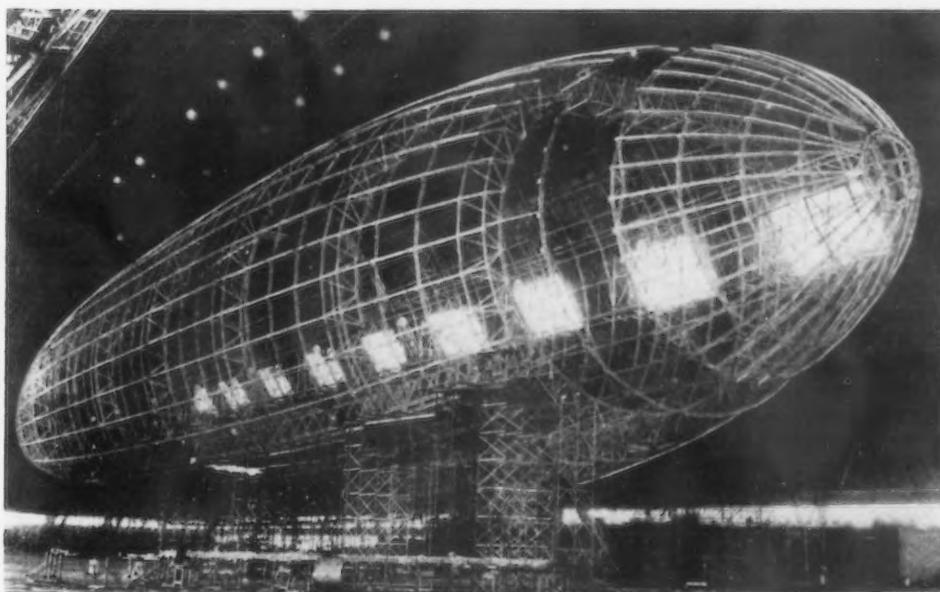
Sales of mechanical stokers in February totaled 67 units with 14,249 hp., compared with 85 with 25,902 hp., in January, according to reports received by the Bureau of the Census from 11 leading manufacturers.

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STRUCTURAL FRAME OF A GIANT DIRIGIBLE

THE completed structural framework of the new giant dirigible, "Akron," which will soon take the air from the dock of the Goodyear-Zeppelin Corp., Akron, Ohio. This unusual view was taken for the Paasche Airbrush Co., Chicago, whose airpainting equipment was used to paint the dirigible frame.

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Machine-Tool Accessories and Small Tools in 1929

BREAKDOWN by the United States Bureau of the Census of the country's 1929 production of machine-tool accessories and small tools makes it possible to ascertain, for the first time, how much of each of the principal items was made. Total production under these heads is given as \$167,230,319 (revised, the original total figures, without details, appeared in THE IRON AGE of Jan. 8, page 206).

Eighty-one per cent of the total, or

Attachments and Fixtures	
General equipment:	
Chucks (lathe).....	\$2,725,483
Chucks (drill).....	1,309,913
Chucks (magnetic).....	326,254
Jaws (face plate).....	88,512
Die-heads (threading).....	718,600
Dividing heads.....	20,265
Vises (machine).....	182,232
All other.....	46,259
Special equipment:	
Jigs and fixtures.....	19,762,019
Punch-press equipment:	
Sub-presses, punches, dies, etc.....	45,584,660
Die-casting and drop-forging dies.....	1,232,754
Tools for screw and automatic machines:	
Box tools, hollow mills, work and tool holders, etc.....	4,046,307
Specially designed tools.....	5,652,279
Special machinery.....	5,006,984
Special order work not reported by kind.....	1,780,973
All other attachments and fixtures.....	5,481,047

\$134,565,862, represents the output of plants engaged specifically in the manufacture of these accessories and tools. The remainder, \$32,664,457, represents tools and attachments made as secondary products in the machine tool industry and elsewhere.

Of the total, \$94,027,541 comes under the heading of attachments and fixtures, and \$73,202,778 represents small tools. In major details these are shown in the table.

Small Tools	
Arbors and collars.....	\$278,167
Collets.....	343,342
Counterbores.....	1,116,719
Countersinks.....	65,222
Drills (carbon).....	4,096,029
Drills (high-speed).....	9,911,434
Hobbing cutters (high-speed).....	2,078,916
Lathe tools (carbon).....	457,177
Lathe tools (high-speed).....	683,466
Milling cutters (carbon).....	558,463
Milling cutters (high-speed).....	10,146,063
Reamers (carbon).....	3,114,356
Reamers (high-speed).....	5,042,556
Saw blades.....	292,615
Threading tools:	
Taps and dies (not pipe threading):	
Taps (carbon).....	3,526,272
Taps (high-speed).....	3,062,694
Dies (carbon).....	1,337,119
Dies (high-speed).....	1,362,676
Chasers.....	3,251,469
Pipe threading:	
Taps.....	300,435
Dies.....	1,346,867
Pipe stocks complete with dies.....	2,338,528
All other small tools.....	11,595,495
Precision measuring tools and gages.....	5,870,807
Other measuring tools.....	1,018,891

Steel Construction Gives More Employment

WASHINGTON, April 7.—A marked improvement of business in the steel construction industry is fast eliminating the employment emergency in that group, according to a statement received by Col. Arthur Woods, chairman of the President's Emergency Committee for Employment, from Charles N. Fitts, president, American Institute of Steel Construction.

"With the opening of spring construction," says Mr. Fitts, "the firms reporting to the American Institute of Steel Construction state that their hours of labor, number of working days per week and total payroll have consistently increased, and, if continued at the present rate, will be back to normal again by the beginning of summer. Our employment outlook has been greatly improved by the tonnage lettings, which have been heavier during the first three months of 1931 than during the same period of 1930.

"During the peak of the depression, which was reached in the winter

months, drastic measures were adopted by the steel construction industry to retain as many men as conditions permitted. Now that improvement is setting in, our member companies are able to return to a more normal régime.

"One firm in the South writes: 'About six or eight months ago we cut down our shop hours from nine to seven per day. About six weeks ago, however, we increased the time to 8 hr. per day, due to improvement in our business.'

"From New England, a report was received stating: 'We have discontinued making cuts in our force and are holding our organization intact in the hope that business soon will improve. We are inclined to believe that things already are on the mend.'

"Following are some of the practices applied by steel construction companies during the depression to keep employment at a maximum. A firm in the West adopted the expedient of working in 6-hr. instead of 8-hr. shifts. In Pittsburgh, the office forces were held intact, but some firms reduced the shop force to four-day weeks. On the West Coast the shop force was put on a 44-hr. week and

workmen were rotated on the jobs. In other cases, the work week was reduced to 40 hr. In the Middle West, where the slump was for a time most acute, plants adopted the practice of using the men on repairs and plant improvements.

"Full recovery will mean the re-employment of about 10,000 persons who have been out of work, and will increase the working hours of about 15,000 who have been on part time. Normal employment in the steel construction industry is about 40,000."

Industrial Coal Stocks for 30 Days

Supplies of bituminous coal in industrial and other consumers' hands in the United States, as of March 1, were estimated by the National Association of Purchasing Agents to be sufficient to last for 30 days, used at the current rate of consumption. By industries the stocks were as follows:

	Days
By-product coke plants.....	31
Electrical utilities.....	44
Coal gas plants.....	62
Railroads.....	24
Steel mills.....	24
Other industries.....	30

Total stocks on hand in industries March 1 were figured at 31,595,000 net tons, a reduction of about 2,000,000 tons, or 6 per cent, during February, and a figure nearly 4,000,000 tons below the season's peak, on Jan. 1. The total is about the same as that on April 1, 1930, and again on July 1, but is 5,000,000 tons lower than on March 1 of last year.

Industrial consumption for February was given as 28,916,000 net tons, the lowest figure since last September, which was only fractionally lower. With that exception it is the lowest figure in more than a year. The drop from January, about 8 per cent, was about in proportion to the number of days. February production of coal in the United States was given as 36,799,000 tons, much the lowest monthly figure in more than a year. The reduction from January was 7,900,000 tons, or 17.7 per cent.

Logan Iron & Steel Co., Burnham, Pa., manufacturer of staybolts, engine bolts, and other wrought iron products, has appointed William L. Brown, 1600 Arch Street, Philadelphia, as special representative in Philadelphia and southern territory.

Northern Engineering Works, 210 Chene Street, Detroit, has opened a Cleveland office in the Fidelity Building, 1940 East Sixth Street.

Rail Production 1,873,233 Tons in 1930, Smallest Since 1897

Only Small Amount Made of Bessemer Steel—Heavier
Weights in Increasing Proportion

PRODUCTION of steel rails in the United States in 1930 is reported by the American Iron & Steel Institute to have been 1,873,233 gross tons. About 2 per cent of this total was rerolled rails, and about 0.11 per cent was Bessemer rails. There were 45 tons of electric rails. All of the rest, amounting to 1,834,933 tons, was open-hearth rails. The total, which was the smallest since 1897, was very close to the estimate of 1,850,000 tons, made in THE IRON AGE of Jan. 1 last.

Further increase was made in the proportion of rails of the heaviest weights. In 1930 the rails of 120 lb. and over totaled 592,933 tons, or 31.7 per cent of the aggregate. This is the largest such proportion ever reached,

being slightly higher than the 1929 ratio of 30.7 per cent, which was the previous record.

Adding the rails of 100 to 120 lb. weight to the yard, a total of 1,428,429 tons was made, representing 76.3 per cent of the aggregate rail tonnage for the year. This compares with 76.0 per cent in 1929, which was the previous record in this respect.

Alloy-treated rails made in 1930 were 4687 tons. This was more than double the similar tonnage of 1929, and with the exception of 1928 was the largest aggregate since 1924. About one-ninth of the alloy-treated rails were treated with titanium and most of the rest with manganese of 10 per cent or over. All were made by

open-hearth and electrical processes. These rails were made in a variety of weights, roughly proportional to the general production of all rails, although more than half of the total were of 120 lb. and over.

Rerolled rails made from old rails amounted to 36,118 tons, the smallest such figure in more than 20 years. Rails rerolled from new seconds or new defective rails aggregated 5790 tons, bringing the total of rerolled to 41,908 tons.

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Canada's Pig Iron Output 747,178 Tons in 1930

Final statistics show that the production of pig iron in Canada during 1930 totaled 747,178 gross tons, compared with 1,080,160 tons in 1929, 1,037,727 tons in 1928, and 709,697 tons in 1927.

Imports of pig iron during 1930 amounted to 13,643 gross tons, a decline of 58.1 per cent from the total of 32,548 tons brought in during 1929. Exports were recorded at 593 gross tons, compared with 7478 tons in 1929.

Machinery Exports Make Further Gain

Washington, March 31.—Marking the fourth successive monthly increase, exports of machinery from the United States in February rose \$6,221,000 to a total of \$43,964,146, compared with \$37,743,000 in January. The gain is emphasized by the fact that February was a short month. Except for 1930 and 1929, the total was the largest for any February.

There were some sharp losses, however, in February, while the most striking gain was in exports of agricultural machinery. This movement increased to \$21,670,000 from \$12,517,000, a gain of \$8,153,000, or in excess of the total export increase. Losses of considerable proportions were registered in industrial machinery, which dropped to \$12,900,000 from \$15,089,000, and mining and quarrying machinery, which declined to \$734,000 from \$1,606,000.

Exports of machine tools rose to a value of \$2,951,000 from \$1,882,000. Exports of machinery and vehicles increased to a value of \$61,665,000, against \$54,103,000.

Imports of machinery declined to \$1,152,414 from \$1,249,320. Imports of machinery and vehicles amounted to \$1,404,607, while incoming shipments of industrial, office and printing machinery were valued at \$642,232.

Imports of Machinery into the United States

	(By Value)		Two Months	
	February		Ended February	
	1931	1930	1931	1930
Metal-working machine tools.....	\$20,837	\$102,167	\$35,227	\$266,372
Agricultural machinery and implements.....	582,222	1,706,713	1,072,341	2,418,223
Electrical machinery and apparatus.....	105,972	95,598	276,310	250,047
Other power-generating machinery.....	17,556	5,132	32,501	90,176
Other machinery.....	351,646	644,617	804,135	1,601,530
Automobiles and other vehicles, except agricultural..	74,181	185,979	181,220	369,348
Total	\$1,152,414	\$2,740,206	\$2,401,734	\$4,995,696

Machinery Exports from the United States

(By Value in Thousands of Dollars)

	February		Two Months	
	February		Ended February	
	1931	1930	1931	1930
Locomotives	\$4	\$54	\$27	\$74
Other steam engines.....	5	12	70	68
Boilers	15	105	36	327
Accessories and parts.....	32	53	80	131
Automobile engines.....	237	968	414	1,262
Other internal combustion engines	358	339	659	806
Accessories and parts.....	203	53	384	131
Electric locomotives.....	44	93	96	178
Other electric machinery and apparatus	428	905	872	1,976
Excavating machinery.....	245	790	602	1,777
Concrete mixers.....	18	65	37	158
Road-making machinery...	63	250	148	294
Elevators and elevator machinery	164	476	486	1,121
Mining and quarrying machinery	734	1,438	2,331	3,251
Oil-well machinery	1,012	3,494	3,293	6,168
Pumps	387	817	943	1,844
Bending and power presses	341	251	755	537
Machine tools.....	2,951	1,819	4,615	3,703
Forging machinery.....	136	159	518	443
Other metal-working machinery and parts.....	250	582	557	1,228
Textile machinery	515	716	1,073	1,755
Sewing machines	351	736	743	1,465
Shoe machinery.....	70	138	183	297
Flour-mill and gristmill machinery	13	20	30	41
Sugar-mill machinery.....	80	57	160	318
Paper and pulp-mill machinery	101	330	256	567
Sawmill machinery.....	66	80	95	190
Other woodworking machinery	81	99	192	340
Refrigerating and ice-making machinery	224	317	464	647
Air compressors	134	560	375	1,215
Typewriters	867	1,704	1,855	3,911
Power laundry machinery.....	92	205	172	330
Typesetting machines.....	183	341	451	697
Printing presses.....	117	311	280	830
Agricultural machinery and implements	21,670	21,272	33,969	34,966
All other machinery and parts	11,773	17,798	24,489	40,474
Total	\$43,964	\$57,407	\$81,710	\$113,520

Foundrymen Announce Program for Chicago Meeting, May 4-7



ATENTATIVE technical program for the annual convention of the American Foundrymen's Association at the Hotel Stevens in Chicago, May 4 to 7, has been announced as follows:

MONDAY, MAY 4

- 3 p. m. GENERAL OPENING MEETING.
Address of President.
"A Cross-Section of the British Foundry Industry," by V. C. Faulkner, Editor, *Foundry Trade Journal*. (Exchange paper of Institute of British Foundrymen.)
4.30 p. m. SHOP OPERATION COURSE—Sand Control (1st session)—Moisture Control.

TUESDAY, MAY 5

- 9 a. m. SHOP OPERATION COURSE—Sand Control (2nd session)—Permeability and Fineness.
10 a. m. GRAY IRON—High-Test Alloy Cast Iron and Testing.
"Manufacture and Use of Cupola High-Test and Alloy Irons in a Machine Tool and Jobbing Foundry," by L. M. Sherwin and T. F. Kiley, Brown & Sharpe Mfg. Co., Providence, R. I.
"Testing Cast Iron," by Major Nicolau, Paris, France. (Exchange paper of French Foundry Technical Association.)
"A New Type of Inclusion in Cast Iron and Its Relation to Manganese and Silicon Content," by F. J. Cook, Birmingham, England.
10 a. m. MALLEABLE—Metals and Melting.
"Thermal Balances of Melting Furnaces and Production Costs in Malleable Foundries," by J. H. Hruska, Berwyn, Ill.
"Report of Representative on Joint Committee on Refractories," by J. R. Allan, International Harvester Co., Chicago.
Reports of Committees.
10 a. m. NON-FERROUS—Foundry Costs.
"Weak Points in a Cost System Which Permit Leakages," by E. A. Baker, E. A. Baker Corp., New York.
10 a. m. PATTERN PRODUCTION—Round-Table Meeting.
12.15 p. m. MALLEABLE DIVISION—Luncheon and Round-Table Discussion.
2 p. m. FOUNDRY COSTS.
Report of Committee to Formulate Data Which Should Be Supplied when Estimates Are Requested.
Report of Committee on Methods of Determining Molding Costs.
2 p. m. SAND RESEARCH.
"Shape of Sand Grains," by Dr. H. Ries and G. D. Conant, Cornell University, Ithaca, N. Y.
"Relation Between Sand Grains and Strength of Sand," by Dr. H. Ries and H. V. Lee, Cornell University, Ithaca, N. Y.

"Effect of Heat on Permeability of Facing and Core Sands," by W. M. Saunders, Providence, R. I.
"Some Observations on Use of Synthetic Sands," by L. B. Knight, National Engineering Co., Chicago.
Reports of Committees.

- 4 p. m. SHOP OPERATION COURSES.
Steel (1st session)—Shrinkage of Steel, Shrinkage Allowance, Distortion of Patterns, and Proper Heading and Gating.
Gray Iron (1st session)—Cupola Practice.
Malleable (1st session)—Melting Practice.
Non-ferrous (1st session)—Fluidity and Shrinkage as Factors Affecting Gating.

WEDNESDAY, MAY 6

- 9 a. m. SHOP OPERATION COURSE—Sand Control (3rd session)—Bond Strength Control.
10 a. m. GRAY IRON—Melting Methods.
"Melting Gray Iron and Malleable Iron in the Indirect-Arc Furnace," by J. H. Vogel and J. C. Bennett, York Ice Machinery Corp., York, Pa.
"Electric Process Iron for Cylinder and Cylinder-Head Castings," by H. E. Bromer, Standard Foundry Co., Racine, Wis.
"A Hot, Blast Cupola," by J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.
"Effect of Excessive Atmospheric Moisture on Cupola Operation," by N. A. Moore, Piston Ring Co., Muskegon, Mich.
10 a. m. NON-FERROUS—Plant Methods.
Report of Committee on Recommended Practices.
"Improved Brass Foundry Practice," by D. G. Anderson, Western Electric Co., Chicago.
"Deep Etching of Brass as Applied to Gating Problems," by R. W. Parsons, Ohio Brass Co., Mansfield, Ohio.
"Cupola Melting of Brass," by T. Mauland, International Harvester Co., Chicago.
"Bronze Pressure Castings," by J. E. Crown, United States Naval Gun Factory, Washington.

- 10 a. m. STEEL FOUNDRY—Metallurgy.
"Chemical Composition as Employed for Classifying Carbon and Alloy Steels for Castings," by Major R. A. Bull, Electric Steel Founders' Research Group, Chicago.
"Some Metallurgical Points in Acid Open-Hearth and Electric Steel for Castings," by F. A. Melmoth, Detroit Steel Casting Co., Detroit.
Reports of Committees.

- 12.15 p. m. STEEL DIVISION—Luncheon and Round-Table Discussion.
12.15 p. m. NON-FERROUS DIVISION—Luncheon and Round-Table Discussion.

- 2 p. m. APPRENTICE TRAINING.
"Getting a Community Apprenticeship Program Under Way," by H. S. Falk, Falk Corp., Milwaukee.
"Related Instruction," by S. M. Brah, Tri-City Manufacturers' Association, Moline, Ill.
4 p. m. SHOP OPERATION COURSES.
Steel (2nd session)—Cleaning Room Practice.
Gray Iron (2nd session)—High-Test Iron.
Malleable (2nd session)—Molding Practice.
Non-ferrous (2nd session)—Gating Practice with Reference to Aluminum Bronze, Manganese Bronze, Yellow Brass and Nickel Alloys.

THURSDAY, MAY 7

- 9 a. m. SHOP OPERATION COURSE—Sand Control (4th session)—Sand Losses.
10 a. m. GRAY IRON—General Practice.
"Factors Which Influence the Surface Quality of Gray Iron Castings," by W. G. Reichert and D. Woolley, Singer Mfg. Co., Elizabeth, N. J.
"The Microscope as a Tool in Investigating Cast Iron," by R. M. Allen, Bloomfield, N. J.
"Gates," by M. Kuniansky, Lynchburg Foundry Co., Radford, Va.
"A Contribution to the Study of the Part Played by Phosphorus in Cast Iron," by J. Dessent and M. Kagan, Liège, Belgium. (Presented on behalf of Belgium Technical Association.)
"The Effect of Soaking Time on Initial Temperature and Analysis," by W. H. Spencer and M. M. Walding, American Cast Iron Pipe Co., Birmingham, Ala.
10 a. m. NON-FERROUS—Plant Practice.
"Molding Practice for Heat-Treated Aluminum-Alloy Castings," by L. H. Fawcett, United States Naval Gun Factory, Washington.
"The X-Ray as a Tool for Improving Aluminum-Alloy Foundry Practice," by H. J. Rowe and E. M. Gingerich, Aluminum Co. of America, Cleveland.
"Permanent-Mold Foundry Practice for Bronze Castings," by Henri Marius, Lenoir Car Works, Lenoir City, Tenn.
10 a. m. STEEL—Plant Practice.
"A Comparison of Synthetic and Natural Bonded Molding Sands for Steel Foundries," by H. J. Cole, General Electric Co., Schenectady, N. Y.
"Interrelationship of Pin-Hole Trouble and the Low Ductility Problem," by George Batty, Steel Castings Development Bureau, Philadelphia.
"Detecting Casting Defects by Radiography, Using Gamma Rays," by C. W. Briggs and R. A. Gezelius, Naval Research Laboratory, Anacostia, D. C.
2 p. m. BUSINESS MEETING.
Reports of Officers and Committees.
"Centrifugal Casting of Guns," by Col. T. C. Dickson, Watertown Arsenal, Watertown, Mass.
4 p. m. SHOP OPERATION COURSES.
Steel (3rd session)—Heat Treating Practice.
Gray Iron (3rd session)—Gates and Risers.
Non-ferrous (3rd session)—Gating Practice as Related to Red Brass and Aluminum Alloys.

Registration will commence at 9 a. m., May 4, followed by committee meetings. The exhibition will officially open at noon.

Ingot output in March gained 10 per cent on February, itself 14.5 per cent above January. The total was the largest since last August. Prices were slightly lower.



Steel Ingot Production in March Shows Further Substantial Gain

PRODUCTION of open-hearth and Bessemer steel ingots in March made a gain of more than 10 per cent on the daily average, and of almost 20 per cent in the month's total, compared with February. The calculated month's output of all companies, based on reports from those which made 94.27 per cent of the 1929 tonnage, was 3,023,440 gross tons. This is the first time

since last August that production has passed the 3,000,000-ton mark. It is up more than 50 per cent from the low December figure, with the same number of working days in the two months.

On the daily basis, production was 116,286 tons, the highest since last August, and, correspondingly, 50 per cent above the low in December. Expressed in percentage of operation,

the March output is given as 54.74 per cent, compared with a low in December of 38.57 per cent.

Open-hearth output gained 20 per cent over the February total. Bessemer output went up 16½ per cent.

Total production for the first quarter is calculated at 8,033,964 tons. This is a gain of more than 1,000,000 tons from the preceding quarter, but is nearly 35 per cent below the first quarter of 1930, when 12,174,322 tons was made. Output for the first quarter was at the average daily rate of 104,337 tons in the 77 working days.

These figures do not include electric and crucible steel. Approximately 1 per cent should be added to each figure above, in determining the total steel ingot output of the country.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)

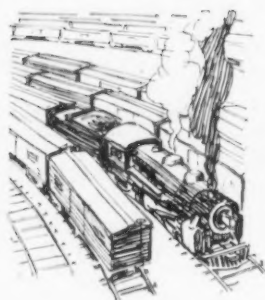
	Reported by Companies Which Made 94.27 Per Cent of the 1929 Ingots		Calculated Output of All Companies		No. of Working Days
	Open-Hearth	Bessemer	Monthly	Daily	
Total, 1929.....	44,101,321	7,091,680	54,312,279	174,639	311
1930					
January	3,137,002	441,572	3,796,090	140,596	27
February	3,336,021	508,618	4,078,327	169,930	24
March	3,513,904	539,616	4,299,905	166,381	26
Three months....	9,986,927	1,489,806	12,174,322	158,108	77
April	3,406,610	509,234	4,153,860	159,764	26
May	3,265,190	528,968	4,024,778	149,066	27
June	2,835,527	407,586	3,440,239	137,610	25
Six months.....	19,494,254	2,935,594	23,793,199	153,505	155
July	2,411,592	353,723	2,933,399	112,823	26
August	2,543,466	374,467	3,095,293	119,050	26
September	2,273,668	429,975	2,867,978	110,307	26
October	2,164,830	399,704	2,720,414	100,756	27
November	1,806,109	300,337	2,234,482	89,379	25
December	1,665,875	226,854	2,007,774	77,222	26
Total, 1930	32,359,794	5,020,654	39,652,539	127,500	311
1931					
January	2,044,298	296,620	2,483,206	91,971	27
February	2,085,529	296,974	2,527,318	105,305	24
March	2,504,060	346,137	3,023,440	116,286	26
Three months....	6,633,887	939,731	8,033,964	104,337	77

McInnes Steel Co. Reorganized

The McInnes Steel Co., Corry, Pa., manufacturer of crucible tool steels, has been reorganized, with the following officers: F. E. Whittlesey, president; Colin McInnes, vice-president; Harry B. Smith, secretary; A. G. Postlethwait, treasurer. These officers, with E. J. Lewis, constitute the board of directors. Mr. Lewis is plant superintendent.

Mileage Freight Rates on Steel in Switching Districts Opposed

Pittsburgh Companies Object to Railroad Proposal, But Want Short-Haul Reductions



PROPOSAL of the railroads in Central Freight Association and Trunk Line territories to apply the mileage scale of freight rates on steel products, as ordered recently by the Pennsylvania Public Service Commission, in Pennsylvania to all movement in the territories covered, including switching districts, was vigorously opposed by steel company traffic managers at a hearing held in Pittsburgh on April 1.

The carriers' proposal, as presented by Harry Wilson, chairman of the general freight committee of the Central Freight Association, would call for a reduced scale of rates on shipments of steel products for distances up to 100 miles. The action resulted from a decree of the Public Service Commission of Pennsylvania holding that short-haul rates as ordered by the Interstate Commerce Commission in Official Classification territory, following an extensive investigation under the Hoch-Smith resolution, were unreasonable in distances up to 100 miles.

Pittsburgh district steel companies in particular objected to the short-haul charges, and the decision of the Pennsylvania commission afforded them considerable relief. The lower rates, as prescribed by the Pennsylvania commission, were to have been effective April 10, but a 60-day extension is being asked.

Want Switching Rates Undisturbed

While steel company traffic managers attending the hearing did not object to the general application of the lower short-haul rates in the territories concerned, if present switching districts were maintained, they felt that application of mileage scales in switching districts would seriously disturb long-standing relationships. W. S. Guy, traffic manager, Carnegie Steel Co., Pittsburgh, stated that such an advance in switching rates on iron and steel products would discriminate against steel producers and consumers, as relatively more perishable articles would continue to move at a lower charge. Other shippers were in agreement with Mr. Guy, and generally opposed an increase in switching rates. A number of them pointed out that such a move on the part of the carriers would result in a further diversion of traffic from the railroads to trucks and barges, automatically defeating the main purpose behind the proposed schedule.

There was some disagreement among shippers as to whether they

would prefer the present rate structure, as prescribed by the Interstate Commerce Commission, to a general reduction in short-haul rates, including switching districts, but most of the traffic representatives seemed to prefer to take the chance of getting relief on short-haul movement from the State commissions.

High Rates Suspended in Some States

The high rates on short hauls have already been suspended by State com-

missions in Illinois, Indiana and Pennsylvania. Steel companies in Ohio, West Virginia and New York seem to feel that similar relief could also be obtained for them in the same manner on intra-State movement. In that manner the existing switching charges would not be disturbed, but relief on movements up to 100 miles would be obtained.

The railroads were unable to state their probable action resulting from the hearing.

Iron and Steel Capacities Largely Increased in 1930

CAPACITY figures for iron and steel plants in the United States, as of Dec. 31 last, have been prepared by the American Iron and Steel Institute. These show an increase of about 2 per cent in capacity for making pig iron, about 10 per cent in blast furnace capacity for ferroalloys and about 6 per cent in capacity for making steel ingots.

As shown in the table, the gain in ingot capacity has been heavy in both basic open-hearth steel and in electric steel. There has been a definite loss in acid open-hearth, Bessemer and crucible steel capacities. The gain in basic open-hearth steel has been 4,361,000 tons. This is the largest gain ever made, with the exception of the huge construction in 1916 to take care of mounting war orders. Electric ingot capacity advanced 28,000 tons, or rather less than 4 per cent.

Losses shown in ingot capacity included almost 10 per cent in acid open-hearth steel, which has dropped below 1,000,000 tons; 5½ per cent in

Bessemer steel, which is now at the lowest level in many years; 8½ per cent in crucible steel, the total capacity for which now stands at only slightly more than one-eighth the figure of 11 years ago.

Total ingot capacity, at 66,897,096 gross tons, represents 215,103 tons a day, based on 311 working days a year. This compares with 202,790 tons a day at the end of 1929, on the same basis.

Present blast furnace capacity, including both pig iron and the ferroalloys made in blast furnaces, is 52,659,875 tons. On the 365-day year this represents 144,274 tons a day, compared with 141,525 tons a day as of Dec. 31, 1929.

Steinmetz & Co., Inc., furnace engineer, will move its office from Morris Building, Philadelphia, to 220 South Sixteenth Street, same city.

Capacity of American Iron and Steel Furnaces
(In Gross Tons)

Product	Dec. 31, 1930	Dec. 31, 1929	Percentage Change	
			Increase	Decrease
Pig iron.....	51,850,775	50,921,450	1.83	...
Ferroalloys (blast furnaces only)...	809,100	735,230	10.05	...
Total	52,659,875	51,656,680	1.94	...
Basic open-hearth.....	57,071,880	52,710,980	8.27	...
Acid open-hearth.....	927,690	1,022,690	...	9.29
Bessemer	8,070,000	8,532,000	...	5.42
Electric	801,940	773,890	3.62	...
Crucible	25,586	27,986	...	8.58
Total ingots.....	66,897,096	63,067,546	6.07	...

OFF THE ASSEMBLY LINE



March Automobile Output About 285,000 Units; Further Gains Are Expected

DETROIT, April 6.

THE National Automobile Chamber of Commerce estimates that its members produced 187,848 cars in March, which represents a gain of 26 per cent over February. Output of the Ford Motor Co., which does not belong to the chamber, was 95,000 to 100,000 units; thus the industry's total for March was about 285,000 cars. This lifts first quarter performance close to and possibly above the 700,000 mark, compared with over a million in the same period of 1930.

Some of the slackening in steel specifications from the automobile industry the past two weeks has been the result of the Ford company over-buying in February for its March requirements. Orders were placed with mills for steel for some 20,000 to 25,000 cars more than were manufactured. This meant that deliveries which should have been completed in March dragged over into the early part of April, and this month's releases in some cases will be held back temporarily. The result is that Ford's May purchases, to be made the coming week, will be considerably leaner than anticipated.

The Rouge plant still remains on a schedule of three days a week, although most branch assembly plants are said to be operating five days a week. This difference is explained by the fact that in the fourth quarter Ford maintained a higher production rate than retail sales justified, thus building up banks of parts which have been worked off in recent weeks. Ford's April program calls for expansion, possibly as much as 25 per cent.

Some Companies Gained in March

STUDY of the March figures shows that Ford lost ground in comparison with the remainder of the indus-

try. It produced slightly less than 37 per cent of all cars in February, but last month fell to 34 per cent. Chevrolet likewise gave ground, dropping from 29 to 27 per cent, despite an output of 79,603 cars in March, the largest month since last May. Here, then,

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First-quarter motor car production in United States and Canada was about 700,000 units compared with over 1,000,000 in same period of 1930.

* * *

Ford made 95,000 to 100,000 cars and Chevrolet 79,000 in March; however, other makers gained at expense of these two companies in percentage of cars produced.

* * *

Tentative April schedules are: Ford, upward of 100,000 cars; Chevrolet, 85,000; Chrysler, 30,000; Buick, 13,000; Oakland-Pontiac, 12,000; Willys-Overland, 10,000; Oldsmobile and Studebaker, 8,000 each; Auburn, 6,000.

* * *

Auburn has shipped more cars since Jan. 1 than in entire year 1930. In March, Buick and Cadillac-LaSalle bettered last year's record and Studebaker had best month since September, 1929. Reo has introduced lower-priced line of Royales. Marmon has adopted free wheeling as optional equipment on its model 70.

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is concrete evidence of gains made by other makers, particularly in the medium-price field. They stepped up a full five points in the past 30 days and seem likely to hold their position during April.

Reports emanating from the other companies reveal the sources of the betterment. The Auburn Automobile Co. shipped 5649 Auburns and Cords in March, setting an all-time record. This compares with 2499 cars in March, 1930. During the first quarter the Auburn company turned out 11,718 units and by April 10 will have shipped more cars than in the entire year 1930. Unfilled orders at the beginning of this month had increased 2000 over those on hand March 1, and April production is expected to be 6000 cars as a minimum. All of the company's plants are running at capacity, with many departments working night shifts.

Studebaker's shipments in March, at 7011 cars, were the best since September, 1929. It now has unfilled orders which are the largest in 12 months and factory stocks are reported at the lowest point in many years. Hudson has gone on a four-day-week schedule, with 500 cars daily coming off the assembly lines. In March, Buick made 10,550 cars, compared with 8760 in March, 1930; its April program calls for 13,457 cars, against 9601 in the same month of last year. Oakland-Pontiac produced about 12,000 cars last month, with a slight increase planned for April. Willys-Overland is operating on a basis of 10,000 cars a month. Oldsmobile shipped 7024 cars in March and is counting on 8000 this month.

No official figures are available yet regarding the March showing of the Chrysler Corp., but it is known that the Dodge, Chrysler six and the

Chrysler Imperial have been making good records, while production of DeSotos and Plymouths has been augmented in the past 30 days. Current operations are understood to be at the rate of 25,000 cars a month, and this pace will be quickened in the near future. Cadillac-LaSalle shipped 2332 cars in March, compared with 1851 in the same month of 1930. Reo assembled 1201 cars last month and will accelerate output substantially in April. Graham-Paige turned out 2064 cars in March. Packard has been making about 80 cars a day five days a week.

Marmon Adopts Free Wheeling

THE newest recruit to the free wheeling ranks is the Marmon Motor Car Co. with its Marmon 70, on which this feature is optional at an extra charge of \$35. This tends to confirm reports that the use of free wheeling or similar transmission is costing automobile manufacturers from \$25 to \$35 a car. Reo has brought out a new line of lower priced Royales, on a 131-in. wheelbase, selling in the \$2,000 class. It is recalled that the original Royale, introduced last October, is now \$2,700. There seems also a possibility that Reo will put on the market shortly a car in the light eight group. It also is preparing to expand its line of commercial vehicles both above and below its present price range so as to provide complete coverage in the truck field.

Railroads Reduce Rates on Automobiles

IN an attempt to regain some of the business lost to trucking companies, railroads are putting into effect on April 20 reductions in freight rates on finished automobiles ranging from 11 to 50 per cent. The largest decreases are on cars shipped less than 500 miles, as it is in the short hauls that truck competition has been most disastrous. These revisions will be reviewed at a meeting in Detroit this week of traffic managers of automobile companies and railroad traffic officials. Among the subjects to be discussed are the lengthening of freight cars to facilitate the floor loading of automobiles, transcontinental automobile freight rates, shipping of mixed carloads of automobile parts, and rates on cotton piece goods used in body building. It is believed that truck operators will not surrender the volume of automobile business they now enjoy without a struggle. Their first countermove is expected to be lowering of charges.

Ford May Take Inventory in Mid-Summer

THE Ford Motor Co. is understood to be considering the plan of taking annual inventory at the mid-year period instead of during the last two weeks of December, as heretofore. This arrangement would result in a lay-off of employees in the summer

months and insure them steady work in the winter, when they can least afford to be idle. The agreement among members of the National Automobile Chamber of Commerce to refrain from offering new models during the summer, confining their efforts to the last two months of the year, will accomplish the same results proposed by Mr. Ford. It will bring forward to September or early October the plant inactivity incident to the tooling up for new models, thus insuring good production in the winter months.

Further evidence has come to light the past week illustrating the extent to which automobile manufacturers reduced inventories in 1930. General Motors made a cut of \$52,174,108, thereby dropping its total to \$136,298,891. During its last fiscal year, ended Nov. 30, Nash decreased its inventories \$2,478,070 to the unusually low amount of \$2,768,024. Auburn and Peerless did likewise, materials on hand at the end of last year having been about 45 per cent less than in December, 1929.

Airplane Designed Like an Automobile

AN airplane built like an automobile, designed by William B. Stout, is to be displayed at the National Aircraft Show to be held in Detroit from April 11 to 19. Terminating in a knife-edge stern at the trailing edge of the wing, the body is being finished

by a maker of custom-built motor cars. Its two seats are in tandem and a set of controls is provided for each.

The plane, which is all-steel, weighs only 1000 lb., and is powered by a 75-hp., four-cylinder air-cooled engine of the inverted type. The engine is inclosed in the body, but projects a few inches above the wing. Tail surfaces are carried by a skeleton or outrigger fuselage composed of three main members, which form a guard about the pusher propeller and make it virtually impossible for a careless mechanic or bystander to come within the arc of the whirling blades. Beneath the fuselage is a keel 10 in. deep which will protect passengers in the event of a bad landing.

There are two main wheels in line with the center of gravity and about 10 ft. apart. They are carried by a vertical shock absorber having a 14-in. play. Under the nose is a third wheel and under the stern a rubber-tired castor. The ship lands on its main and nose wheels and when empty tips back to rest on the main wheels and castor. The wings have a 43-ft. span and the ailerons are of the floating type. Hand levers operate the wheel brakes and the control stick is capped by a rotating knob, which is the stabilizer adjuster. The instrument board includes an automobile-type ignition lock. The motor is started by means of an automobile starter. Gasoline for 4½-hr. cruising is carried in two wing tanks.

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British Metallurgists to Visit United States

Plans are being made for a visit to the United States in 1932 of the Iron and Steel Institute and the Institute of Metals of Great Britain. Both of these societies have recently sent out printed notices with a provisional itinerary for the benefit of prospective British visitors.

In 1928 a cordial invitation was received by these British technical societies from the American Institute of Mining and Metallurgical Engineers and the American Iron and Steel Institute to hold the 1932 autumn meeting of the Iron and Steel Institute of Great Britain in the United States. A similar invitation was issued to the Institute of Metals.

The provisional committee of the organization in the United States is as follows: H. Foster Bain, secretary, A. I. M. and M. E.; E. A. S. Clarke, secretary, American Iron and Steel Institute; Dr. Paul D. Merica, assistant to the president, International Nickel Co., New York, and J. V. W. Reynders, consulting mining engineer, New York.

The party, which is expected to number about 100 European members, will leave Southampton, England, ac-

cording to the provisional itinerary, on Saturday, Sept. 3, arriving in New York, Sept. 10.

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Engineers to Discuss Aeronautics

The fifth national technical meeting of the aeronautic division of the American Society of Mechanical Engineers will be held at Baltimore, May 12-14. Cooperating organizations include the Engineers Club of Baltimore and the local sections of the American Society for Steel Treating, American Institute of Electrical Engineers, American Society of Civil Engineers, and American Chemical Society.

Airplane metal developments, including steel construction, metallurgical problems, fatigue of metal and skin stresses, will be discussed at one session. Other sessions will be devoted to engines, airplane design, airship developments, communication, instruments and piloting, airports and the management and operation of air lines. Visits to airplane manufacturing plants in Baltimore and vicinity are being planned.

National Industrial Congress Meets in Cleveland, April 13-17

Management, Maintenance and Materials Handling to Be Featured in Program and Exhibits

THE technical program of this year's National Industrial Congress, which, in featuring management, maintenance and materials handling, is designated briefly as the Three-M Congress, is given below. Sessions will be held in club-rooms A, B and C of the Public Auditorium.

The second Industrial Equipment Exposition, with displays of materials handling, maintenance and management equipment and supplies, as well as several educational exhibits, will be held throughout the week in the exhibition hall adjacent to the meeting rooms. It will be open afternoon and evening of each day, except Thursday, April 16, when, because of the banquet, it will not be open in the evening.

Cooperating organizations include the American Society of Mechanical Engineers, American Management Association, Society of Industrial Engineers, Cleveland Engineering Society, Cleveland Electrical Maintenance Engineers Association and the Elimination of Waste Committee. The technical program follows:

Monday, April 13

- 2:00 p. m.—**Scrap Handling**, Room B.
Auspices, Elimination of Waste Committee.
Handling of Thin Sheet Scrap in Tin Plate and Sheet Steel Mills, by H. H. Giles, American Sheet & Tin Plate Co., Monessen, Pa.
Handling of Automobile Body Scrap, by R. R. Reese, plant engineer, Packard Motor Co., Detroit.
Briquetting of Cast Iron Borings and Steel Turnings, by A. K. Nowak, Baldwin-Southwark Co., Chicago.
Discussion of Handling and Disposition of Ferrous Scrap.
- 8:00 p. m.—**Waste Elimination**, Room B.
Auspices, Elimination of Waste Committee.
Segregation and Control of Waste, by C. H. McKnight, supervisor inventory control, General Electric Co.
Waste Campaign Experiences and Suggestion Systems, the experiences from several companies.
(Poster exhibit in meeting room. Waste exhibit in Exposition.)

Tuesday, April 14

- 8:30 a. m.—**Plant Inspection Trips**.
- 2:00 p. m.—**Management**, Room B.
Developments in Manufacture of Lead Covered Paper Insulated Telephone Cables, by J. R. Shea, assistant engineer of manufacture Western Electric Co.
Planning a Lead Covered Telephone Cable Manufacturing Plant, by L. C. Hanley, Western Electric Co.
- 2:00 p. m.—**Hoists and Monorail Handling**, Room C.

Monorail Handling of Materials, by C. W. Preston, Majestic Household Utilities Co., Chicago.

Engineering Factors in the Use of Electric Hoists, by H. J. Fuller, engineer, New York.

Bulk Handling Methods for Pipe, by E. W. Burgess, A. O. Smith Co., Milwaukee.

8:00 p. m.—**Drafting Room Management**, Room A.

Production Management Applied to the Drafting Department, by W. J. Kunz, Combustion Engineering Co.

Improved Drafting Room Management, by F. D. Newbury, Westinghouse Electric & Mfg. Co.

8:00 p. m.—**Management**, Room B.

Distribution and Marketing, by Gorton James, vice-president Thompson & Lichtner Co., Boston.

8:00 p. m.—**Standardization in Materials Handling**, Room C.

Wednesday, April 15

- 8:30 a. m.—**Plant Inspection Trips**.
- 2:00 p. m.—**Conveyor Handling**, Room B.
Synchronization of Production Control and Conveyorization, by E. M. Olin, works manager Westinghouse Electric & Mfg. Co., Mansfield, Ohio.
Materials Handling for Mass Production at General Electric Plant, by H. C. Rundle.
- 2:00 p. m.—**Out-Door Handling**, Room C.
Handling Equipment for Bulk Materials and Special Purposes, by Arthur F. Case and Paul M. Douglas, Wellman Engineering Co., Cleveland.
Remote A. C.-Controlled Haulage at the Plant of the Trinity Portland Cement Co., by R. F. Emerson, industrial engineer, General Electric Co., Schenectady.
Industrial Type of Internal Combustion Engine Locomotive, by S. B. Schenck, Westinghouse Electric & Mfg. Co.

8:00 P. M.—**Design Handling Equipment**, Room A.

Application of Two-Speed Motors to Electric Hoists, by C. E. Schirmer, Robbins & Myers.

Variable-Speed Transmission for Materials Handling, by D. W. Clem, Reeves Pulley Co.

Types of Materials to Use in Materials Handling Equipment, by Harvey Skinner, Boston.

8:00 p. m.—**Management**, Room B.

Skills and Satisfaction, by Dr. Lillian Gilbreth, president Gilbreth, Inc., Montclair, N. J.

8:00 p. m.—**Trucking and Shipping**, Room C.
Skids and Skid Shipments, by R. L. Lockwood, New York.

Use in Marine Terminals, by H. E. Stocker.
Use in Railroad Terminals and Stores, by J. B. Miller.

Handling on Skids, by C. C. Stuber, manager industrial transportation Goodyear Tire & Rubber Co., Akron.

The Use of Gas Trucks and Tractors in Materials Handling, by George E. Hagemann, editor, Alexander Hamilton Institute, New York.

Thursday, April 16

- 9:30 a. m.—**Organization for Maintenance Engineers**, Room C.
Variations in Maintenance Costs and Procedure, by E. B. Stoody, and G. I. Ross, MacDonald Brothers, Boston.
Departmental Analyses and Wage Incentives, by W. G. Uhler, consulting engineer, Harvey, Ill.
Control of Non-Productive Costs, by Harry W. Benton, plant engineer Pratt & Whitney Co.
Organization and Operation of the Electrical Maintenance Department, by Sidney Watkins, chief electrician Warner & Swasey, Cleveland.

9:30 a. m.—**Materials Handling**, Room B.

Automatic Electric Control of Materials Handling, by J. E. Wood, Monitor Controller Co., Cleveland.

Pneumatic Handling of Vegetable Potash, by J. F. Barnard, United States Industrial Alcohol Co., Baltimore.

Handling Small Packages in the Shop, by C. A. Fike, Westinghouse Electric & Mfg. Co.

2:00 p. m.—**Operating**, for Maintenance Engineers, Room C.

Maintenance of Electric Cranes and Hoists, by Robert W. Walton, Shepard-Niles Corp'n.

Tools for the Maintenance Engineering Departments, by T. A. Keefer, National Cash Register Co., Dayton.

Inspection for Preventive Maintenance, by A. Heckman, Westinghouse Electric & Mfg. Co.

2:00 p. m.—**Materials Handling**, Room B.

Use of Rubber Products for Materials Handling, by H. E. Cook, B. F. Goodrich Co., Akron, Ohio.

Weighing and Counting Devices Used on Materials Handling Equipment, by A. B. Jacobus, Fairbanks Co., New York.

6:30 p. m.—**Banquet**, National Congress, all cooperating societies participating.

Friday, April 17

- 8:30 a. m.—**Plant Inspection Trips**.
- 2:00 p. m.—**Housekeeping**, for Maintenance Engineers, Room C.
Maintenance of an Industrial Illumination System, by R. C. Smith, Western Electric Co.
Maintaining the Lighting System, by Walter Sturrock, Nela Park, General Electric Co.
Maintenance Painting, by T. J. Maloney, New Jersey Zinc Co.
- 2:00 p. m.—**Materials Handling**, Room B.
Handling Bulk Materials Mechanically, by W. W. Sayers, Link-Belt Co., Chicago.
Uses and Application of Portable Belt Conveyors, by J. B. Bray, vice-president Fairfield Engineering Co., Marion, Ohio.
Handling of Materials in Automotive Machine Shops, by N. H. Preble, J. B. Webb Co., Detroit.

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H. E. Rose, who had been connected with the Weaver Brothers Co., Adrian, Mich., for four years, two years as secretary of the company, has opened an office as manufacturer's agent specializing in metal picking equipment at 11902 Phillips Avenue, Cleveland.

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DeVilbiss Co., Toledo, Ohio, manufacturer of spray painting and spray-finishing equipment, has established a training school to instruct workers in mechanical spray painting.

March Iron Output Gains 7.6 Per Cent

—Net Gain of Eight Furnaces

FOR the third consecutive month, there was a gain in pig iron output last month. With every operating furnace sending in returns, the March daily rate of output made the substantial gain over February of 7.6 per cent. There was also a gain in active furnaces.

Coke pig iron production in March was 2,032,248 gross tons, or 65,556 tons per day for the 31 days. This contrasts with 1,706,621 tons, or 60,950 tons daily, for the 28 days in February. The gain in daily rate for

March was 4606 tons, or 7.6 per cent. In February the gain was 10.2 per cent, with 3 per cent the gain for January over December.

Net Gain of Eight Furnaces

The March daily rate of 65,556 tons is the smallest for that month since March, 1921, when it was 51,468 tons. The record for March was 119,822 tons per day in 1929. Disregarding the depression of 1930, the next most recent smallest month to March, this

year, was August, 1924, at 60,875 tons per day.

Ten furnaces were blown in during March and only two were blown out or banked. The net gain was therefore eight. In February the net gain was six, with the January gain at seven. For the first quarter of this year the net gain was 21 furnaces, with 28 the net gain for the same period in 1930.

Of the ten furnaces blown in during March, five belonged to the Steel Corporation, three to independent

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1927—Gross Tons

	1927	1928	1929	1930	1931
Jan.	100,123	92,573	111,044	91,209	55,299
Feb.	105,024	100,004	114,507	101,390	60,950
Mar.	112,366	103,215	119,822	104,715	65,556
April	114,074	106,183	122,087	106,062	.....
May	109,385	105,931	125,745	104,233	.....
June	102,988	102,733	123,908	97,804	.....
½ year...	107,351	101,763	119,564	100,891	.....
July	95,199	99,091	122,100	85,146	.....
Aug.	95,073	101,180	121,151	81,417	.....
Sept.	92,498	102,077	116,585	75,890	.....
Oct.	89,810	108,832	115,745	69,831	.....
Nov.	88,279	110,084	106,047	62,237	.....
Dec.	86,960	108,705	91,513	53,732	.....
Year ...	99,266	103,382	115,851	86,025	.....

Pig Iron Production by Districts, Gross Tons

	March (31 days)	Feb. (28 days)	Jan. (31 days)	Dec. (31 days)
New York and Mass.	100,660	91,216	99,352	93,448
Lehigh Valley.....	47,293	40,232	41,033	45,411
Schuylkill Valley.....	29,390	24,711	25,509	27,703
Lower Susq. and Leba- non Valley.....	19,187	16,458	18,974	18,375
Pittsburgh district.....	427,034	356,341	357,128	346,877
Shenango Valley.....	46,476	35,361	38,929	47,096
Western Pennsylvania..	56,354	45,657	40,988	28,656
Maryland, Va. and Ky..	85,148	78,374	82,436	60,803
Wheeling district.....	98,348	88,372	102,320	111,609
Mahoning Valley.....	176,262	134,247	75,339	67,131
Central and North'n Ohio	198,855	172,266	184,519	169,575
Southern Ohio.....	32,230	7,730	26,160	26,139
Illinois and Indiana....	453,241	379,537	384,453	386,963
Mich., Minn., Mo., Wis., Colo. and Utah.....	86,972	80,452	85,186	101,254
Alabama.....	172,982	153,900	150,251	134,650
Tennessee.....	1,816	1,767	1,689	.....
Total	2,032,248	1,706,621	1,714,266	1,665,690

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
March, 1930.....	83,900	20,815	104,715
April	85,489	20,573	106,062
May	84,310	19,973	104,283
June	77,883	19,921	97,804
July	66,949	18,197	85,146
August	64,857	16,560	81,417
September	62,342	13,548	75,890
October	57,788	12,043	69,831
November	49,730	12,507	62,237
December	40,952	12,780	53,732
January, 1931.....	45,883	9,416	55,299
February	49,618	11,332	60,950
March	54,075	11,481	65,556

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

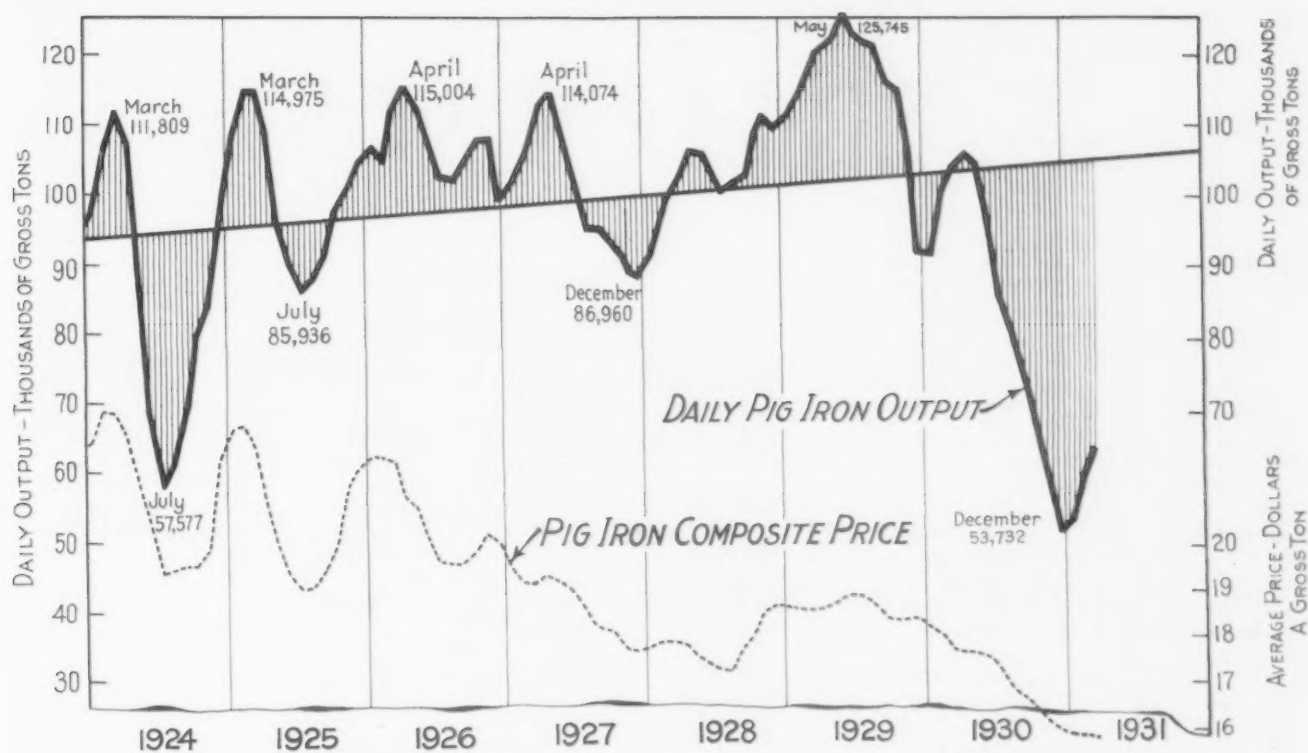
	April 1		March 1	
	Number in Blast	Rate of Operation	Number in Blast	Rate of Operation
New York:				
Buffalo	4	2,600	4	2,630
Other N. Y. and Mass.	2	655	2	630
New Jersey	0	.....	0	.....
Pennsylvania:				
Lehigh Valley.....	4	1,525	4	1,435*
Schuylkill Valley.....	2	950	2	880
Susquehanna Valley..	1	620	1	590
Ferromanganese	0	.....	0	.....
Lebanon Valley.....	0	.....	0	.....
Ferromanganese	0	.....	0	.....
Pittsburgh District...	22	14,700	20	12,755
Ferro. and Spiegel...	1	150	2	325
Shenango Valley.....	3	1,775	2	1,265
Western Pennsylvania	2	1,395	2	1,365
Ferromanganese	2	420	2	265
Maryland	3	2,200	3	2,270
Wheeling District.....	4	3,170	4	3,155
Ohio:				
Mahoning Valley.....	9	5,815	8	4,900
Central and Northern..	11	6,705	10	6,150
Southern	3	890	2	235
Illinois and Indiana....	21	14,780	20	14,070
Mich., Wis. and Minn...	3	1,580	3	1,635
Colo., Mo. and Utah....	3	1,225	3	1,240
The South:				
Virginia	0	.....	0	.....
Ferromanganese	1	105	1	100
Kentucky	1	435	1	425
Alabama	12	5,965	10	5,225
Ferro. and Spiegel...	1	160	1	240
Tennessee	1	60	1	65
Total	116	67,880	108	61,850

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1929—Gross Tons

	1929	1930	1931
Jan.	3,444,370	2,827,464	1,714,266
Feb.	3,206,185	2,838,920	1,706,621
Mar.	3,714,473	3,246,171	2,032,248
3 months.....	10,365,028	8,912,555	5,453,135
Apr.	3,662,625	3,181,868	.....
May	3,898,082	3,232,760	.....
June	3,717,225	2,934,129	.....
½ year.....	21,640,960	18,261,312	.....
July	3,785,120	2,639,537	.....
Aug.	3,755,680	2,523,921	.....
Sept.	3,497,564	2,276,770	.....
Oct.	3,588,118	2,164,768	.....
Nov.	3,181,411	1,867,107	.....
Dec.	2,836,916	1,665,690	.....
Year*	42,285,769	31,399,105	.....

*These totals do not include charcoal pig iron. The 1930 production of this iron was 96,580 gross tons.



Daily production of pig iron is still somewhat further below needs than in 1924

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 575,000 tons.

steel companies, and two to merchant companies. One Steel Corporation furnace and one independent steel company stack was shut down.

Operating Rate on April 1

There were 116 furnaces operating on April 1 with an estimated daily rate of 67,880 tons. This contrasts with 108 furnaces on March 1 with an operating rate of 61,850 tons daily.

Furnace Changes in March

The following blast furnaces were blown in during March: "B" furnace at the Lackawanna plant of the Beth-

lehem Steel Corp. in the Buffalo district; one Donora furnace of the American Steel & Wire Co. and one Carrie furnace of the Carnegie Steel Co. in the Pittsburgh district; No. 2 Ohio furnace of the Carnegie Steel Co. in the Mahoning Valley; No. 3 Shenango furnace in the Shenango Valley; No. 2 furnace of the National Tube Co. in Northern Ohio; the Hamilton furnace in Southern Ohio (blown in late in February—not reported last month); No. 9 Gary furnace of the Illinois Steel Co. in the Chicago district; No. 1 Pioneer furnace of the Republic Steel Corp. and No. 3

Woodward furnace of the Woodward Iron Co. in Alabama.

Only two furnaces were blown out or banked during March, as follows: "H" furnace at the Lackawanna plant of the Bethlehem Steel Corp. in the Buffalo district and No. 3 Isabella furnace of the Carnegie Steel Co. in the Pittsburgh district.

Possibly Active Furnaces Reduced

With the announcement of the dismantling of the McKeefrey furnace in the Mahoning Valley, owned by the Atlas Steel Supply Co., Cleveland, the total number of possibly active furnaces in the United States is reduced from 309 to 308.

Production of Steel Companies for Our Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1929	1930	1931	1929	1930	1931
Jan.	2,651,416	2,214,875	1,422,382	28,208	27,260	14,251
Feb.	2,498,901	2,284,234	1,389,304	25,978	21,310	19,480
Mar.	2,959,295	2,600,980	1,676,316	24,978	23,345	27,899
3 months ..	8,109,612	7,100,089	4,488,002	79,164	71,915	61,630
Apr.	2,826,028	2,564,681	.....	22,413	27,777	.....
May	3,105,404	2,613,628	.....	25,896	30,296	.....
June	2,999,798	2,304,223	.....	33,363	27,327	.....
½ year....	17,040,842	14,582,621	.....	160,836	157,325	.....
July	3,039,370	2,075,414	.....	31,040	17,728	.....
Aug.	3,065,874	2,010,572	.....	28,461	20,909	.....
Sept.	2,862,799	1,870,269	.....	27,505	21,181	.....
Oct.	2,902,960	1,791,421	.....	31,108	24,480	.....
Nov.	2,498,291	1,491,927	.....	31,866	18,619	.....
Dec.	2,112,704	1,269,529	.....	28,564	16,288	.....
Year	33,522,840	25,101,753	.....	339,380	276,530	.....

*Includes output of merchant furnaces.

Texas-Chicago Gas Line to Be Completed July 1

Ford, Bacon & Davis, Inc., New York, has been awarded the contract for construction of the last section of the natural gas pipe line extending more than 950 miles from the Texas Panhandle to Chicago. The last, or seventh, link of this project, running from Rock Island to Joliet, Ill., will be 155 miles long, and the contract provides for its completion on or before July 1. The seventh section will be made of 24-in. pipe, the standard size employed throughout the line.

PERSONALS

C. F. WILEY has been appointed manager of sales of the electrical and wire rope department, Chicago, of the American Steel & Wire Co., filling the vacancy caused by the death of C. S. Knight. Mr. Wiley is a graduate of Cornell University, class of 1907. His early experience was gained with the Standard Asphalt & Rubber Co. and the Leonard Construction Co. He entered the fence and sales department of the American Steel & Wire Co. 22 years ago. Later he was transferred to the manufacturer's sales department, and 15 years ago he entered the rope department. D. A. Merri-man, vice-president and general manager of sales, has also announced that A. H. MOWRY has been appointed manager of sales, electrical and wire rope department, New York, to fill the vacancy created by the recent promotion of JOHN MAY.

J. B. BARTHOLOMEW, formerly Western manager of sales engineers in the Chicago office of the Bethlehem Steel Co., has been made contract manager for the McClintic-Marshall Corp., with headquarters at Chicago.

W. N. CROUT has been placed in charge of the newly opened branch office, at 1120 Midland Bank Building, Cleveland, of the Armco Railroad Sales Co., Middletown, Ohio.

HARRINGTON EMERSON, a pioneer in scientific management, received a certificate of honorary membership in the Masaryk Academy of Work, at a luncheon meeting, March 18, at the Engineers' Club, New York. Dr. JAROSLAV NOVAK, consul general of Czechoslovakia, represented the academy and CALVIN W. RICE, secretary of the American Society of Mechanical Engineers, presided.

F. H. WILLCOX, vice-president of Freyn Engineering Co., returned to this country on March 29. He has been in England and on the Continent in connection with various projects which the Freyn Engineering Co. is executing abroad. Among these are the blast furnace plant for Ford Motor Co., Ltd., at Dagenham, England, and the blast furnace plant for the South African Iron & Steel Industrial Corp., Ltd., Pretoria, South Africa.

WILLIAM J. LINN, export manager, Cleveland Pneumatic Tool Co. and the Cleveland Rock Drill Co., associated concerns, has been named vice-president of the Cleveland Export Club.



George G. Landis

GEORGE G. LANDIS, who has been identified with the Lincoln Electric Co., Cleveland, for the past eight years, has been made chief engineer. He was graduated from Ohio State University with a B.S. in electrical engineering and immediately after that went with the General Electric Co. He later associated himself with the Westinghouse Electric Co. Mr. Landis's first duties with the Lincoln company were of an experimental nature. He was later placed in charge of electrical design of both motors and arc welders, and some time afterward was given charge of mechanical design. Many of the patents held by his employers are the result of his efforts.

M. C. SUERKEN and ROBERT M. FITZGERALD have been made sales representatives of the New York and Philadelphia offices, respectively, of the Reliance Electric & Engineering Co., Cleveland.

M. G. STERNBERG has been appointed operating manager of the Continental Roll & Steel Foundry Co., Chicago. W. E. TROUTMAN, vice-president in charge of operations, has announced. For the past five years Mr. Sternberg has been general superintendent of the Hubbard Steel Foundry Co., East Chicago, Ind., which was merged with the Duquesne Steel Foundry Co., Coraopolis, Pa., and Wheeling Mold & Foundry Co., Wheeling, W. Va., in August, 1930, to form the Continental company.

JOHN R. FREEMAN, noted engineer and past-president of the American Society of Mechanical Engineers and of the American Society of Civil Engineers, is to be tendered a testimonial dinner on the evening of April 21 at the Providence-Biltmore Hotel, Providence, R. I. HENRY D. SHARPE, president, Brown & Sharpe Mfg. Co., and chairman of the honorary committee, will preside. J. A. HALL, professor of mechanical engineering at Brown University, is secretary of the committee.

JOHN E. JAMES has been appointed chairman of the board and managing director of the Lancashire Steel Corp. by the Securities Management Trust, which controls the company.

JOHN A. HOPKINSON, prior to 1915 a representative in the United States for Sanderson Brothers & Newbould, Sheffield, England, and also associated with the Colonial Steel Co., Pittsburgh, and since 1915 with Hall & Pickles, Ltd., Manchester, England, has been elected a director of Jonas & Colver, Ltd., Attercliffe, Sheffield.

CYRIL WATTS, director and secretary of the South Wales Tin Plate Corp. and chairman of the management committee of the London Iron and Steel Exchange, has been appointed secretary of Richard Thomas & Co., London.

HARRY W. PETTY, formerly district sales manager at Cleveland for the American Steel Foundries, Chicago, has joined the sales department of the Union Steel Casting Co., Pittsburgh.

GLENN MERREFIELD has resigned as foundry superintendent of the Clark Equipment Co., Buchanan, Mich., and has accepted a similar position with the Pettibone-Mulliken Co., Chicago.

I. L. AU WERTER has been appointed sales representative of the Champion Rivet Co., Cleveland, in the Michigan territory east of Grand Rapids, with headquarters at 2034 Dime Bank Building, Detroit. Mr. Au Welter will continue to represent in a sales capacity the Apollo Steel Co.

CHARLES E. CURTIS, chairman of the board, Western Iron Stores Co., Milwaukee, has resumed more active connections with the company, following the death of Ralph M. Friend, secretary and treasurer, and has been elected president and treasurer. WAL-

TER W. ETHIER becomes vice-president, continuing as general manager. WILLIAM C. MUELLER has been elected secretary. C. W. KRUEGER is sales manager. The company is a large jobber of mechanics' tools, mill supplies and factory equipment.

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ROY J. GIDDINGS, who recently retired as vice-president and sales manager, Badger Wire & Iron Works, Milwaukee, has joined the Wisconsin Art Bronze & Iron Co., a new Milwaukee company, in the same capacities. Mr. Giddings has been identified with the ornamental metal goods industry for 18 years.

♦ ♦ ♦

C. J. KATZE-MILLER, for several years associated with the Northwest-ern Fan & Blower Co., Milwaukee, ventilating apparatus, has been appointed district representative for Wisconsin and Minnesota by the Hartzell Propeller Fan Co., Piqua, Ohio. He will conduct the agency as the Hartzell Propeller Fan Sales Co.

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BENJAMIN G. HARMON has been elected vice-president of the Gas Machinery Co., Cleveland, and will be in charge of its furnace engineering division. Mr. Harmon's headquarters will be at the company's Chicago office, 6 North Michigan Avenue.

♦ ♦ ♦

WILLIAM G. PRAED has been appointed radiograph engineer in charge of the new commercial X-ray laboratory of the Claud S. Gordon Co., Chicago, manufacturer of high-temperature industrial equipment. Mr. Praed worked on gun-sight layouts for the Bethlehem Steel Co. during the war, and later was connected with the Link-Belt Co., Indianapolis, having worked up from tool maker to assistant to the general superintendent. He has been identified with the American Society for Steel Treating since its organization and was twice chairman of its Indianapolis chapter.

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MARK F. HOEPER has been appointed general manager of the Jenkins Machine Co., Sheboygan Falls, Wis., manufacturer of wood-working and other special machinery and conducting a jobbing gray iron foundry. He formerly was associated with the company.

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WALTER H. WIEWEL has been made sales manager of the Timken Steel & Tube Co., Canton, Ohio, succeeding A. J. SANFORD, who has resigned. Mr. Wiewel has been associated with the company for several years as manager of steel sales in New York. He will make his headquarters at Canton.

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C. O. HADLY has resigned as secretary, Trade Research Bureau, United States Steel Corp., Pittsburgh, to enter other business.

▲ ▲ ▲ OBITUARY ▲ ▲ ▲

FREDERICK W. BRUCH, president, Acme Machinery Co., Cleveland, manufacturer of bolt and nut-making machinery, died April 1, aged 79 years. He was born in Bavaria, Germany, and when a child was brought to this country by his parents and had since lived in Cleveland. After completing his education in the public schools, he learned and for several years followed the machinists' trade. Later he entered into partnership with Claus Greve and Daniel Luehrs under the name of the Acme Co. In 1892 the company was incorporated. He was the only surviving member of the original partnership and was active in the company's affairs until shortly before his death. He was a member of several Cleveland clubs and of the Cleveland Chamber of Commerce. He was formerly a director of a Cleveland bank and had been affiliated with various Cleveland manufacturing companies as a director. He is survived by two sons, Carl F. and Edward P. Bruch, both officers of the Acme company, the former vice-president and the latter a director.

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CHARLES A. COLLINS, vice-president of the M. A. Hanna Co. and president of the Hanna Furnace Co., Cleveland, died April 1 of pneumonia after a brief illness, at the age of 53 years. He was also a director and vice-president of the National Steel Corp. Mr. Collins was born in Cleveland and had been affiliated with the Hanna interests since 1896 after his graduation from Central High School in that city. In 1900 he was transferred to Buffalo to represent the Hanna interests in the Buffalo Union Furnace Co. and later became vice-president of that company. In 1925 he was elected to the offices in the two Hanna companies which he held up to his death, and in that year moved back to Cleveland.

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STEWART A. TRENCH, vice-president of C. S. Trench & Co., metal brokers, New York, also publishers of the *American Metal Market*, died of heart disease, April 2, at his home in Jersey City, N. J., as he was preparing to leave for his office. Mr. Trench was 65 years old. He was a brother of the late C. S. Trench.

♦ ♦ ♦

ANDREW ELLICOTT MACCOUN, superintendent of blast furnaces at the Edgar Thomson works of the Carnegie Steel Co., Braddock, Pa., died at his home in North Braddock, Pa., on April 4. He was born at Baltimore in 1874 and attended Johns Hopkins University, from which he was graduated with the degrees of mechanical and electrical engineer. After leaving college he was identified for a time with the Thomas A. Edison Lab-

oratories in New Jersey, and entered the steel business in 1895 as assistant superintendent of the electrical department of the Homestead steel works of the Carnegie company. In 1897 he was made superintendent of the electrical department in the Edgar Thomson works, and six years later became master mechanic. He had been superintendent of blast furnaces since 1905, and was chairman of the Carnegie company's blast furnace committee at the time of his death.

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J. G. JOSEPH, president and founder of the Buffalo Steel Co., Tonawanda, N. Y., died at the Millard Fillmore Hospital in Buffalo. He had been in business in Tonawanda for the past 31 years, the company of which he was president having started operations there in April, 1900. He was 70 years old.

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CHARLES A. BUMPUS, president of Cobb & Drew, Inc., Plymouth, Mass., one of the oldest tack manufacturers in this country, died at his home in that city on March 23, aged 80 years. He had been identified with the company for 60 years.

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GEORGE H. RICHEY, New England representative of the Sullivan Machinery Co., Chicago, was instantly killed on April 1 when struck by an express train near the West Medford, Mass., station. He was 41 years old and went to Boston from the West some 10 years ago.

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JAMES SPENCE, of the James Spence Iron Foundry, Jersey City, N. J., died March 6 at the age of 60 years. He had been in the foundry business for 20 years.

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W. C. HOLZWORTH, for several years identified with the Pittsburgh office of E. J. Lavino & Co., Philadelphia, died suddenly at his home in Pittsburgh on April 2, aged 43 years. Mr. Holzworth was born at Lancaster, Pa., and joined the Lavino company at Philadelphia 11 years ago.

♦ ♦ ♦

JOHN W. EXLER, formerly president of the James Lappan Mfg. Co., Pittsburgh, died in a hospital in that city on March 23, aged 72 years.

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FRED L. BRYANT, formerly president of the Chicago Metal Works, Chicago, died suddenly, March 26, at the age of 75 years. He was a native of Herman, Me., and had gone to Chicago 55 years ago. He was at one time manager of the Ames & Frost Bicycle Co.

(ESTABLISHED 1855)

The Price of a Quality Product

“PIGS is pigs” but steel is not always merely steel. The fact that rails are made by the same companies that manufacture other forms of steel does not mean that rails and other mill products are comparable. The steel rail, although running into tonnage, is preeminently a quality product. It is a “Tiffany” job. The prime consideration of both railroads and mills has been to insure safety in travel. In pursuing that aim, more rather than less expense is being incurred in rail production. “Give me a failure-proof rail,” says one railroad executive, “and I will gladly pay \$50 or even \$60 a ton.”

Outside of the steel industry the severe restrictions under which rails are manufactured are not generally realized. The chemical and physical specifications that must be met are unusually strict. No other rolled product is subjected to such rigid tests or to such summary rejection before it passes inspection for shipment. And when it is finally laid in track it is tested with the Sperry detector car. If this final inspection discloses defects in any section, that section must be replaced by the maker free of charge.

Besides measuring up to the increasingly strict specifications of the carriers, the mills have also been obliged to meet demands for longer and heavier rails. A recent 10,000-ton order placed by an Eastern railroad calls for a 152-lb. section. Larger sections require the installation of larger and heavier equipment.

Only a few years ago all rail mills had to lengthen their hot beds and furnaces to make 39-ft. rails, the previous standard length having been 33 ft. Now there are demands for lengths ranging from 45 to 60 ft. One large rail producer estimates that reequipping its plants to meet these new specifications will cost \$18,000,000. In addition, it will have to write off millions of dollars in equipment rendered obsolete. In fact, the heavy expenditures facing the rail industry suggest the necessity of raising, rather than lowering, rail prices, if any change in quotations is to be made.

Aside from the cost burden imposed by the perfection of the technique of rail production, it might also be mentioned that rail business is seasonal and does not provide mills with the economies growing out of continuous operations. Mills as a rule are idle three to four months a year, during which time overhead charges on a huge investment accumulate.

Finally, rail requirements are not expanding. Extensions to our railroad system have virtually ceased, and replacement tonnage is diminishing with the increasing vogue of heavier and better rails. The high quality achieved in rail making is attested by the fact that a recent Sperry detector test of 50 miles of track on an Eastern line failed to disclose a single defect.

Mills and carriers have been partners in striving

for greater safety in rails. It is not surprising that price has not been a cause for haggling. The rail industry has done a difficult job well. It has nothing to conceal and undoubtedly will welcome any fair investigation.

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Wage Rates and Wage Earnings

ARE widespread wage cuts inevitable? As a matter of fact there have been numerous reductions of both salaries and wage rates in industrial plants throughout the country. Salary cuts have been more general than wage rate revisions for the reason that the white-collar workers, as a rule, have been more steadily employed than their fellows in the shop. In other words, maintenance of wage rates by many of our largest and most enlightened manufacturing enterprises has been considered primarily an emergency measure, closely related to the problem of mitigating unemployment. Job rotation and other expedients to give part-time employment to a maximum number of workers have made existing wage scales none too ample in terms of earnings to sustain employees on a subsistence level. With industrial activity still at a low level, it is difficult to see how a cut in rates at this time would be consistent with a humane policy in personnel relations.

And keener appreciation of human values has been the greatest fruit of the depression. Cynics may call it “enlightened” selfishness if they will, but at any rate industrial executives, as never before, have recognized the common interests of management and men. At the expense of higher costs and to the detriment of profits they have done their utmost to keep their employees out of the ranks of the idle. The sacrifices that management has made have appealed to the worker's sense of fair play. To him they are in the same category with his own losses in earnings through sharing work with others—a contribution to a common end, i.e., making the best of a situation over which neither management nor employees have any control.

“A friend in need is a friend indeed” and the good will that enlightened management has won among employees is not to be lightly cast aside. If there were definite assurance that the mere act of reducing wage rates would end the depression, no doubt both employees and employers would be found agreeable to such a step. But there is no such assurance, and meanwhile available work must be divided and mouths must be fed.

The time may come when the manufacturing companies that have maintained wage rates will no longer be able to do so and preserve their integrity. Then necessity will dictate a reduction. But down-

ward revision of wages to preserve dividend payments is difficult to justify, even from the standpoint of the stockholders themselves. The wage earner plays the double role of employee and customer. He is the most important consumer of the products of our mass production industries. If his earnings, already sharply reduced because of part-time work, are cut further, the dividends saved thereby may make the passing of future dividends more certain.

So long as maintenance of wage rates is a relief measure, utilized with other expedients to tide a maximum number of workers over a period of privation, it seems beside the point to talk of a change in policy. If, as some economists now suggest, the current depression is no ordinary cyclical swing but represents an abrupt transition to an entirely new, and much lower, level of values, that fact will become apparent in time through more convincing declines in living costs than have yet occurred, and will influence the setting of wage scales when steady employment can be provided. But the present concern of the majority of our manufacturing workers, and their employers as well, is not wage rates, but earnings that will at least provide food, clothing and shelter.



What Led to the Depression?

DISSATISFACTION with what is variously called the capitalistic or individualistic system of economy has long been expressed by advocates of a change from it to something ranging from the mere penalizing of the well-to-do by taxation to the redness of communism, with numerous shades of color in the intervening spectrum. By the wishful along those lines the economic depression of 1929-31 has been rather welcomed as a lesson illustrating the collapse of capitalism as a satisfactory system of economy.

If the capitalistic system is unable to avoid crises, with their train of unemployment and human misery, ought it not to be scrapped? And what is the good of it, anyway? That is more or less the way in which many minds are running.

Such thoughts naturally overlook that the capitalistic system has produced superlative results in the improvement of human welfare; and that it might logically be unwise to discard it in order to try something untested. No one will contend that the Russian experiment has been brought to a successful conclusion.

The economic crises of 1914 and 1920-22 are directly traced to the advent of the Great War and the immediate consequences thereof, not the bad working of the capitalistic system. Ideas of the latter nature are crystallizing only with respect to the depression of 1929-31.

In respect to the last it may be appropriately asked whether the increase in socialistic tendencies and applications has not in itself been the upsetting influence? There has been a lot of that since 1918 in every civilized country, including our own, although we are euphemistic in our nomenclature and dislike to call a spade by its name.

A good machine may creak and groan if too many monkey wrenches be thrown into its gears. Also it may work badly with unsteady hands at the levers.



Precedents and Departures in Steel

IN "Antony and Cleopatra" Shakespeare wrote: "Age cannot wither her, nor custom stale her infinite variety." Steel has reached quite an age but the same thing can be said of it. The only safe generalization that experience warrants as to steel is that it is likely to do something new. Of course it has often followed precedent, but it has had a way of doing so just about often enough to create confidence in the precedent, whereupon it proceeds to take a new tack.

The interesting question just now is whether steel tonnage will follow what is considered precedent, i. e., decrease to a low point in July. A theory has been held widely, at least until the last two or three weeks, that there would be gradual increases for an indefinite period, though perhaps with a slight dip for the strictly midsummer period. This would be contrary to usual experience, but conditions generally have been unusual.

The tendency of steel production to reach a peak rate in March, or occasionally in April, and then to decline to a low July, has been well marked. That there is a sort of inherent disposition in steel to swing thus is indicated by the circumstance that two years, 1923 and 1927, which had poor second halves, behaved much the same as other years in their first seven months.

The last two years furnished exceptions, however. In 1929 the daily rate of steel ingot production increased sharply through March, dipped a little for April, made a new high record in May and then according to the official figures recorded a trifling further gain for June, which proved to be the high month of the year. In 1930 there was a reversal, February being the month of highest rate. That divergence has been attributed to business in general, having made too strong a start, thinking too much of the fact that the stock market collapse was being left behind and not realizing the probable extent of the general business recession that had begun four months before the stock market's performance.

A mistake was made, and the idea this year has been that the last thing likely would be a repetition of that mistake. The belief has been that buyers have been taking hold more cautiously than is their wont and that, if there were any spring peak at all in steel production, it would come later than usual. Declining production in the latter part of March has naturally raised doubts, but the theory is by no means a bad one at that. One should not have expected any materially higher rate of steel production than was reached; hence relatively minor fluctuations should be expected. And there can be no thought of last year's closing rate as a yardstick, for that was produced by a special combination of unfavorable circumstances.

The steel ingot producing rate recently reached

fell between 5 and 10 per cent short of the average rate in 1930, but one must take account of the difference between impressions left and statistical records. The very poor ending of last year left a bad impression, but the statistics show about 40,000,000 tons of ingots produced during the year. This total includes 24,000,000 tons for the first half and only two-thirds as much for the second half, while the fourth quarter ran more than 40 per cent below the first half rate and December was poorer still. The recent rate was, in fact, around 15 per cent above the average in the second half of last year and about one-third above the fourth quarter rate.

A common opinion now is that for several months steel production will have only minor fluctuations, compared with its recent big swings. It may not increase further, but it is likely to depart from the precedent of having a marked decrease as midsummer is approached.

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Tariffs Here and Abroad

COMPLAINTS against the American tariff duties have been general in Europe. In this connection a statement filed with the (British) Board of Trade some weeks ago, in connection with the subject of a proposed protective tariff for Great Britain, has some interesting features. The following is from a table included in the statement:

Import Duties Per Gross Ton			
Tariff of	Pig Iron	Blooms, Billets	Beams, etc.
United States	4s. 8d.	20 per cent	20 per cent
Germany	10s. 0d.	15s. 0d.	25s. 0d.
France	8s. 3d.	23s. 5d.	23s. 5d.

In the case of France an additional 2 per cent for "turnover tax" is charged on pig iron and semi-finished steel. The American *ad valorem* duties on steel figure out at close to the German specific duties on the same products, being much lower than the French on the semi-finished material.

But on pig iron the American tariff is less than half as high as the average between those imposed by Germany and France.

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CORRESPONDENCE

Wages and Depression

To the Editor: "I see by the papers," as Mr. Dooley was wont to say, that a movement is afoot to bring down the wage rates in manufacturing industries.

Just where this movement originates it is hard to say. Certainly a large number of our most prominent industrial executives have warned us against it. At this time, particularly, it would seem to be most inexpedient, even if prices have fallen faster than wage rates.

Admitting that they have, they certainly have not fallen as rapidly as wages. And that is what people buy with—not with wage rates. Total wages paid in our manufacturing industries have shrunk at least 20 per cent. Have retail prices done likewise? Not so you could notice it!

Suppose that a 10 per cent horizontal cut were made in the already depleted wages paid? How far would that go toward easing the price or profit situation? Wages paid to wage earners who manufacture a product constitute a very small portion of the selling price of that product as a rule. On top of these wages you have overhead, cost of materials, administrative and selling costs, factory profit and retail mark-up. A 10 per cent wage cut would not effect more than a 2 per cent reduction in prices at best. Not enough to be gained here to warrant stirring up trouble.

Everyone knows that the slack and waste is not in productive labor but in distribution and selling. The usual retail mark-up on manufactured products is close to 100 per cent on the average. Why expect the \$25 a week factory hand to pay for the sins of omission of the \$100 a week salesman and the \$300 a week manager? It's neither good sense nor good business.

Mass production cannot stand without mass consumption to support it. That support must come from the \$25 per week fellows, for there are not enough of the other kind to keep the volume sales going.

There are many ways to cut costs without cutting the wage rates of the wage earners. I admit that these ways require brains and managerial ability and are not so easy as issuing a wage decrease notice. But in the long run they are much safer.

The one thing that has heartened the American worker and enabled him to take his medicine manfully has been the attitude of employers in maintaining the wage rate structure. Take that psychological prop away from him now and you will see a depression "what is a depression!"

More power to such leaders as James A. Farrell, who has had the grit to keep product prices from tumbling into the cellar and the courage to maintain his wage rates!

OLNEY B. SERVER.

New York, April 4.

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Conveyor Systems Effectively Decorate a Modern Office

(Concluded from page 1164)

enameled black outside and lined with chromium plating.

Chairs are specially constructed from 7/8-in. tubing used in conveyors and have suspended backs and seats laced to the frame with silk cord. The seats are made of samples of the company's belting. Black cushions cover the belting so that the chairs appear like any chair of modernistic design.

Indirect lighting is obtained from four U-shaped reflectors suspended from the ceiling by chromium plated tubes. These troughs are halves of oval pneumatic tubing painted black to contrast with the silver of the ceiling and walls. Heavy black silk drapes at the six windows of the room permit complete darkness for projecting motion pictures of the company's products from a projector permanently placed at one end of the room.

Incidental furnishings in the room, such as ash trays, cigar and cigarette humidors and a waste basket are all made from conveyor or pneumatic tube parts, designed to show as much of the company's line of products as possible.

MARKETS



Pig Iron Production Increases for Third Consecutive Month

▲ ▲ ▲
MARCH Gain in Daily Rate
of Pig Iron Output Is 7.6
Per Cent—Steel Ingot Produc-
tion Down to 53 Per Cent—
Sheet Prices Reduced
▼ ▼ ▼

INCREASING for the third consecutive month, pig iron production rose 7.6 per cent in March. The gain fell short of the 10 per cent increase in steel ingot output, but with eight more blast furnaces active on April 1 than a month previous and with another stack reported blown in within the past few days, still further expansion of pig iron production is indicated.

March iron output, at 2,032,248 tons, or 65,556 tons a day, compares with 1,706,621 tons, or 60,950 tons daily in February. Notwithstanding the gain, the showing for March was the poorest for that month since 1921.

DEVELOPMENTS of the week include a further slight decline in steel works operations, open price reductions on various finishes of sheets and a somewhat stronger situation in bars, plates and shapes. The recent falling off in steel demand was confined chiefly to flat-rolled products. First reported in automotive specifications, the recession in releases became more general, undoubtedly reflecting growing uncertainty as to prices. With clarification of the price situation and prospects of a recovery in motor car demands, sentiment in the industry is again more sanguine. Business in heavy rolled products showed an encouraging gain at the end of the first quarter and total bookings in finished steel have ceased declining, if they have not yet resumed the increase that began early in the year.

RAW steel production has been curtailed at Chicago, Cleveland, Youngstown and in the East. Larger producers, with more diversified output, have been able to maintain steadier operations than smaller companies. Average ingot production for the country at large is estimated at 53 per cent, compared with 55 per cent a week ago.

RECENT slackening in steel specifications from the motor car industry is now attributed to overbuying by a leading automobile company for its March requirements. Steel deliveries which should have been completed last month were postponed and April releases likewise have been held back temporarily. But notwithstanding this miscalculation of steel needs, April production of motor cars in the United States and Canada is still expected to reach

330,000 to 350,000 units, with May output equaling or slightly exceeding that of the current month.

WHILE it is not likely that unfilled orders for steel gained in March, the opinion persists that peak production for the first half of the year has not yet been reached. Construction, ranging from highway projects to bridge and building work, will soon feel the stimulus of open weather. New fabricated steel business to come up for bids, at 128,000 tons, reached another high weekly figure, raising the total of such work reported since the first of the year to 943,500 tons, compared with 423,000 in the corresponding period in 1930 and 558,000 tons two years ago.

The outlook in construction has no doubt influenced the attitude of mills on prices for plates, shapes and bars. While the quotation of 1.70c., Pittsburgh, remains untested, considerable contract business was driven in at 1.65c., which represents an advance of \$1 a ton over the average shipping price for the first quarter.

WIDESPREAD irregularity in sheet prices may be brought to a halt by open reductions made by at least one producer. Automobile body sheets have been cut \$2 a ton to 3.10c. a lb., Pittsburgh, and light plates, blue annealed sheets and continuous mill sheets have been marked down \$1 a ton. Galvanized sheets are now rather generally available at 2.85c., Pittsburgh, a decline of \$1 a ton.

Weakness persists in the scrap market and heavy melting grade is off 25c. a ton at St. Louis and Detroit. Improvement in pig iron consumption seems to be limited to districts making automotive castings. Valley and Pittsburgh prices on foundry pig iron have become established at the recent advance of 50c. a ton.

Line pipe business is featured by the placing of 9000 tons for an Oklahoma gas line with the National Tube Co. A sale of 60,000 base boxes of tin plate for delivery in Italy has been made by the leading interest.

THE IRON AGE composite price for pig iron has advanced to \$15.79 from \$15.71 a gross ton, its level for the seven preceding weeks. Finished steel is unchanged for the third week at 2.128c. a lb. and heavy melting scrap at \$11.08 a ton for the fifth week.

PITTSBURGH

Buying Caution Halts Improvement in Steel Orders and Operations

PITTSBURGH, April 7.—In the face of considerable pessimism, which is shared by both makers and consumers of steel, conditions in this market do not appear to have become markedly less favorable in the last week. While no improvement in incoming specifications for finished products is reported, releases seem to be holding their own, and in the case of the larger steel companies no reduction in operations has been reported. In fact, one steel works blast furnace has been blown in, and steel ingot production in the district has apparently not fallen under 50 per cent of rated capacity. Such curtailment in raw steel output as has been reported has been widely scattered in plants of the smaller independent companies, which would naturally be more quickly affected by declining demand than the larger interests with diversified output.

Opinion still persists that peak production for the first half has not yet been reached, although it now seems apparent that recent declines in specifications have not been of a momentary character. While falling off in orders was first reported in the automobile industry, conservatism in buying is now rather generally distributed throughout the consuming lines, and thus far no single industry has come forward to make up for recent losses.

While specifications from the carriers for rails and track accessories are said to have been restricted at some points, local mills have not yet been affected. On the other hand, the requirements of the building industry, which might normally be expected to increase with the coming of spring, are slow in picking up, and activity is confined almost entirely to Federal, State and municipal work. Likewise, pipe mills are working off old orders, and new business is not coming out rapidly enough to take their place. Line pipe projects are particularly slow in being awarded. This business, which three months ago promised to be one of the brightest factors in the current situation, is now rather discouraging. Tin plate alone is moving contrary to the general trend, with specifications gradually piling up and current output estimated at 80 to 85 per cent of capacity.

Prices are still subject to shading on a number of products. With the second quarter well under way, recently announced prices on bars, plates and shapes still continue to be nominal. Mills report some business at 1.65c., Pittsburgh, but likewise con-

Fresh wave of extreme conservatism in buying checks expansion of steel activities.

* * *

While there has been no marked reduction in orders or operations, little further progress has been made.

* * *

Ingot output in district remains at about 50 per cent. One additional blast furnace blown in.

* * *

Foundry pig iron prices 50c. a ton higher in Valley and at Pittsburgh furnace.

* * *

Steel price situation uncertain, with shading on some products and advance on bars, shapes and plates still to be firmly established.

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tracts at lower prices have occasionally been extended into the quarter. It does seem likely, however, that in the case of bars, at least, producers have been able to raise the average shipping price about \$1 a ton over the first quarter.

Valley foundry pig iron prices seem to have become better established at \$17, with the other grades unchanged. The scrap market is weaker in tone, although no sales have been made to justify lower prices on the principal grade.

SEMI-FINISHED STEEL

Shipments of billets, slabs and sheet bars have been lower this month, reflecting the reduced operations of non-integrated sheet and strip makers. The price remains nominal at \$30, Pittsburgh or Youngstown. On forging billets the \$36 quotation is still being adhered to, while makers of wire rods, following the coverage of most of their customers at old prices, are now generally adhering to \$37, Pittsburgh.

PIG IRON

With several sales of foundry iron reported to have been made at \$17, Valley furnace, and \$17.50, Neville Island, lower prices on this grade seem to have disappeared. Basic continues at \$16.50 and \$17, with no sales reported to test the market. Bessemer and malleable are holding at \$17, Valley furnace, and \$17.50, Pittsburgh district furnace. Shipments of pig iron continue at about the same rate and, with the exception of one fairly

large sale of foundry iron, new buying is confined to small lots.

Prices per gross ton, f.o.b. Valley furnace:

Basic	\$16.50 to \$17.00
Bessemer	17.00
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Low phos., copper free....	26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton f.o.b. Pittsburgh district furnace:

Basic	\$17.00 to \$17.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Bessemer	17.50

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

RAILS AND TRACK ACCESSORIES

Mills in this district have not experienced a decline in releases on the part of the railroads as a result of the Department of Justice investigation of the \$43 rail price. Shipments during March exceeded those of February by the usual seasonal margin, and thus far there is nothing to indicate that April will fail to show improvement over March. Production of open-hearth rails last year, as announced by the American Iron and Steel Institute, totaled only 1,835,000 tons, a decline of 27 per cent from the average of the last 10 years, which was 2,519,000 tons. If the first quarter is a criterion, 1931 production will show another marked decrease.

BARS, PLATES AND SHAPES

Demand in the past week has not improved materially, and, while consumers are still rather indifferent to future buying, a number of consumers have signed contracts in the last week on the basis of 1.65c., Pittsburgh, on plates and bars. It now appears that this price will apply to a considerable number of contracts during the quarter, although substantial tonnages will undoubtedly move at 1.60c. Producers take most encouragement from the fact that even though the full quoted market is not always obtained, most consumers have been forced to pay an advance of \$1 a ton over their previous contract price. While 1.70c., Pittsburgh, is now being quoted by most producers on spot business, this figure has not been tested. However, it was quoted by a number of companies which bid on the second quarter steel requirements of the New York Central Railroad on April 6. Following the placing of the Pennsylvania Railroad steel last week, the structural market has been rather quiet. Approximately 50,000 tons of this business will be rolled in the

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Apr. 7, 1931	Mar. 31, 1931	Mar. 10, 1931	Apr. 8, 1930
No. 2 fdy., Philadelphia.....	\$17.76	\$17.76	\$17.76	\$20.26
No. 2, Valley furnace.....	17.00	16.50	16.50	18.50
No. 2 Southern, Cin'ti.....	14.19	14.19	14.19	16.69
No. 2, Birmingham.....	12.00	12.00	12.50	14.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	19.50
Basic, del'd eastern Pa.....	17.25	17.25	17.25	19.00
Basic, Valley furnace.....	16.50	16.50	16.50	18.50
Valley Bessemer, del'd P'gh..	18.76	18.76	18.76	20.76
Malleable, Chicago*.....	17.50	17.50	17.50	19.50
Malleable, Valley.....	17.00	17.00	17.00	19.00
L. S. charcoal, Chicago.....	25.04	25.04	27.04	27.04
Ferromanganese, seaboard...	80.00	80.00	80.00	94.00

Rails, Billets, etc., Per Gross Ton:	Apr. 7, 1931	Mar. 31, 1931	Mar. 10, 1931	Apr. 8, 1930
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh..	30.00	30.00	30.00	33.00
Sheet bars, Pittsburgh.....	30.00	30.00	30.00	33.00
Slabs, Pittsburgh.....	30.00	30.00	30.00	33.00
Forging billets, Pittsburgh...	36.00	36.00	36.00	38.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.65	1.65	1.60	1.85

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.65	1.65	1.65	1.80
Bars, Chicago.....	1.75	1.70	1.70	1.90
Bars, Cleveland.....	1.70	1.70	1.70	1.80
Bars, New York.....	1.98	1.98	1.98	2.14
Tank plates, Pittsburgh.....	1.65	1.65	1.65	1.80
Tank plates, Chicago.....	1.75	1.70	1.70	1.90
Tank plates, New York.....	1.93	1.93	1.93	2.07 1/2
Structural shapes, Pittsburgh..	1.65	1.65	1.65	1.80
Structural shapes, Chicago...	1.75	1.70	1.70	1.90
Structural shapes, New York...	1.90 1/2	1.90 1/2	1.90 1/2	2.04 1/2
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh..	1.55	1.55	1.55	1.70
Cold-rolled strips, Pittsburgh	2.25	2.25	2.25	2.55

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel, Per Lb. to Large Buyers:	Apr. 7, 1931	Mar. 31, 1931	Mar. 10, 1931	Apr. 8, 1930
Sheets, black, No. 24, P'gh...	2.25	2.25	2.35	2.55
Sheets, black, No. 24, Chicago	2.35	2.35	2.45	2.65
dist. mill.....	2.85	2.90	2.90	3.30
Sheets, galv., No. 24, P'gh...	2.55	3.00	3.00	3.40
dist. mill.....	2.05	2.05	2.05	2.25
Sheets, blue, No. 13, P'gh...	2.15	2.15	2.15	2.35
dist. mill.....	1.90	1.90	1.90	2.15
Wire nails, Pittsburgh.....	1.95	1.95	1.95	2.35
Wire nails, Chicago dist. mill..	2.20	2.20	2.20	2.40
Plain wire, Pittsburgh.....	2.25	2.25	2.25	2.45
Plain wire, Chicago dist. mill..	2.55	2.55	2.55	2.95
Barbed wire, galv., P'gh.....	2.60	2.60	2.60	3.00
dist. mill.....	\$5.00	\$5.00	\$5.00	\$5.25
Tin plate, 100 lb. box, P'gh...				

Old Material, Per Gross Ton:	Apr. 7, 1931	Mar. 31, 1931	Mar. 10, 1931	Apr. 8, 1930
Heavy melting steel, P'gh....	\$12.75	\$12.75	\$12.75	\$16.00
Heavy melting steel, Phila....	10.50	10.50	10.50	14.00
Heavy melting steel, Ch'go....	10.00	10.00	10.00	13.00
Carwheels, Chicago.....	9.50	9.50	10.50	14.50
Carwheels, Philadelphia.....	13.00	13.00	13.50	15.00
No. 1 cast, Pittsburgh.....	12.50	12.50	12.50	14.50
No. 1 cast, Philadelphia.....	11.50	11.50	11.50	15.00
No. 1 cast, Ch'go (net ton)...	9.50	9.50	9.50	13.50
No. 1 RR. wrot., Phila.....	12.00	12.00	12.00	15.00
No. 1 RR. wrot., Ch'go (net)...	8.25	8.25	8.00	12.25

Coke, Connellsville, Per Net Ton at Oven:	Apr. 7, 1931	Mar. 31, 1931	Mar. 10, 1931	Apr. 8, 1930
Furnace coke, prompt.....	\$2.50	\$2.50	\$2.50	\$2.60
Foundry coke, prompt.....	3.50	3.50	3.50	3.50

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	10.12 1/2	10.12 1/2	10.62 1/2	18.12 1/2
Electrolytic copper, refinery..	9.50	9.50	10.00	17.75
Tin (Strait), New York.....	25.85	26.75	27.20	36.37 1/2
Zinc, East St. Louis.....	3.95	3.95	4.05	5.00
Zinc, New York.....	4.30	4.30	4.40	5.35
Lead, St. Louis.....	4.25	4.25	4.35	5.40
Lead, New York.....	4.50	4.50	4.60	5.50
Antimony (Asiatic), N. Y....	7.00	7.00	7.05	8.00

Pittsburgh district, although operations will not be affected for some time to come. Allegheny County will take bids on April 21 for a bridge over the Youghiogheny River at Boston, Pa., requiring 2000 tons. One or two other city and county jobs are in prospect, but otherwise the structural market in this district lacks promise. For the first time this year, barge buying by private companies is reported, with several miscellaneous units placed in the last week. Heretofore business of this type has been confined to Government work. Shipments of reinforcing bars are increasing, but demand has not gained as rapidly as had been hoped for earlier in the year. Other lines of bars are quiet, with specifications from the automobile industry and the cold-finishing mills rather light.

COLD-FINISHED BARS

The decline in specifications, which has been in evidence since the middle of March, seems to have been checked, but there has been no increase in releases. The industry is operating at about 35 per cent of capacity. Prices

are well maintained at 2.10c., Pittsburgh.

TUBULAR GOODS

A gas company in Oklahoma is reported to have placed 150 miles of various sizes of pipe with a supply company, which will in turn place the business with a Pittsburgh district mill. Otherwise no important line pipe projects have been reported placed, and, as both Pittsburgh and Valley mills have been working rather steadily on this type of work since the first of the year, backlogs have been materially reduced. Several of the projects mentioned earlier in the year as being in prospect have not been abandoned, but are extremely slow in reaching the bidding stage. Steel companies are unwilling to accept long-term payment arrangements which really amount to financing, even though such requests are frequently made. No change is reported in the other types of pipe. Standard pipe still reflects slight improvement, but is far below normal seasonal expectations. Oil country goods are quiet and field stocks are

comparatively heavy. Mechanical tubing has reflected the reduced requirements of the automobile industry.

WIRE PRODUCTS

Moderate improvement in demand for merchant wire products from jobbers in the South and West has continued into April and heavy rains throughout the country have been encouraging to the agricultural regions. Fencing is rather quiet, but barbed wire is expected to be in greater demand than usual, as is ordinarily the case when the buying power of the farmers is impaired. Manufacturers wire is rather dull, but makers report that prices are better established at 2.30c., Pittsburgh, on current orders. The \$2 a keg price on nails is largely nominal, as most users covered at considerably lower prices last month.

SHEETS

Demand for sheets was particularly dull during the last week, and operations have declined rather sharply from the maximum levels reached early in March. The leading interest

THE IRON AGE COMPOSITE PRICES

Finished Steel		Pig Iron	Steel Scrap
April 7, 1931	2.128c. a Lb.	\$15.79 a Gross Ton	\$11.08 a Gross Ton
One week ago	2.128c.	15.71	11.08
One month ago	2.142c.	15.71	11.08
One year ago	2.264c.	17.75	14.33
Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.		Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	
Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.			
High Low		High Low	High Low
1931.....	2.142c., Jan. 13; 2.121c., Jan. 6	\$15.90, Jan. 6; \$15.71, Feb. 17	\$11.33, Jan. 6; \$11.08, Feb. 17
1930.....	2.362c., Jan. 7; 2.121c., Dec. 9	18.21, Jan. 7; 15.90, Dec. 16	15.00, Feb. 18; 11.25, Dec. 9
1929.....	2.412c., April 2; 2.362c., Oct. 29	18.71, May 14; 18.21, Dec. 17	17.58, Jan. 29; 14.08, Dec. 3
1928.....	2.391c., Dec. 11; 2.314c., Jan. 3	18.59, Nov. 27; 17.04, July 24	16.50, Dec. 31; 13.08, July 22
1927.....	2.453c., Jan. 4; 2.293c., Oct. 25	19.71, Jan. 4; 17.54, Nov. 1	15.25, Jan. 11; 13.08, Nov. 22
1926.....	2.453c., Jan. 5; 2.403c., May 18	21.54, Jan. 5; 19.46, July 13	17.25, Jan. 5; 14.00, June 1
1925.....	2.560c., Jan. 6; 2.396c., Aug. 18	22.50, Jan. 13; 18.96, July 7	20.83, Jan. 13; 15.08, May 5

is running at about 40 per cent of capacity, and few independents are maintaining a better rate if week to week averages are taken into consideration. While lack of specifications from the automobile industry is undoubtedly the chief factor in the current dullness, smaller users in diversified lines are restricting their orders and, in these cases, price uncertainty is undoubtedly a factor.

During the last week the general level on galvanized sheets has declined to 2.85c., Pittsburgh, and some makers are meeting concessions of another dollar a ton. The 2.90c. price applies only on small lots. Black sheets are holding at 2.25c., Pittsburgh, and light plates and blue annealed sheets are fairly well maintained at 1.90c. and 2.05c. unless continuous mill competition is encountered. In such cases prices of \$4 to \$6 a ton less have appeared, and jobbing mills have withdrawn. Autobody sheets are nominally quoted at 3.20c. While constant talk of losses sustained at the current selling levels is heard, tonnage seems to be the chief concern of most companies.

TIN PLATE

Production continues to improve. The mills of the leading interest are scheduled at 80 per cent of capacity this week. With some of the large independent companies running at capacity, the average for the industry is not far from 85 per cent, the highest rate reached this year. Reports of uncertainty in the vegetable pack cannot be confirmed. Container makers apparently expect little curtailment.

STRIP STEEL

Continued decline in specifications is fully reflected in operations this week, with the average for the industry ranging from 40 to 45 per cent of capacity, as compared to 55 to 60 per cent a month ago. Releases from the automobile industry are still light and smaller consumers are also restricting their orders. Prices are fairly well maintained at 1.55c. and

1.65c., Pittsburgh, on hot-rolled strip and 2.25c. on cold-rolled.

COAL AND COKE

With most of the usual second quarter contracting on furnace coke out of the way, the market has again lapsed into its recent dullness. In some cases producers were willing to take contracts for the remainder of the year at \$2.50, Connellsville, although this figure is still representative of the spot market. Foundry coke is quiet with specifications against contracts light and new buying negligible. Coal is now in the period between the decline in domestic demand and the beginning of Lake cargo business, and naturally is very quiet.

OLD MATERIAL

The Pennsylvania Railroad is reported to have again rejected bids on

the heavy melting scrap and rails in its recent scrap list, and, while the prices entered are not definitely known, it is understood that they were somewhat lower than those named when the last previous list was offered. No consumer buying of heavy melting steel has been reported in the past week, but the market is sentimentally weaker, and dealers who would have hesitated to make sales at \$13 at the beginning of the month would now be quick to accept this price on comparatively large tonnages. One mill is reported to have bought hydraulic compressed sheets at \$12.75, a decline of 25c. a ton from recent sales. Machine shop turnings are also weaker, one user having placed an order at \$8. Specialties also lack strength, with slight concessions having been made from recent selling prices. The monthly list of the Norfolk & Western Railroad, on which bids will be taken April 10, contains 4500 tons of scrap.

Warehouse Prices, f.o.b. Pittsburgh

*Base per Lb.

Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.75c.
Reinforcing steel bars	2.75c.
Cold finished and screw stock—	
Rounds and hexagons	3.35c.
Square and flats	3.85c.
Bands	3.10c.
Hoops	4.10c.
Black sheets (No. 24), 25 or more bundles	3.25c.
Galv. sheets (No. 24), 25 or more bundles	3.60c.
Light plates, blue annealed (No. 10)	2.75c. to 3.00c.
Blue annealed sheets (No. 13)	2.90c. to 3.05c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.82c.
Spikes, large	2.65c.
Small	2.90c. to 3.05c.
Boat	3.15c.
Track bolts, all sizes, per 100 count, 60 and 10 per cent off list	
Machine bolts, 100 count, 60 and 10 per cent off list	
Carriage bolts, 100 count, 60 and 10 per cent off list	
Nuts, all styles, 100 count, 60 and 10 per cent off list	
Large rivets, base per 100 lb.	\$3.30
Wire, black, soft ann'd, base per 100 lb.	2.40
Wire, galv. soft, base per 100 lb.	2.85
Common wire nails, per keg.	\$2.10 to 2.15
Cement coated nails, per keg.	2.15

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel ..	\$12.50 to \$13.00
No. 2 heavy melting steel ..	11.00 to 11.50
Scrap rails	12.50 to 13.00
Compressed sheet steel ..	12.25 to 12.75
Bundled sheets, sides and ends	11.00 to 11.50
Cast iron carwheels	13.50 to 14.00
Sheet bar crops, ordinary ..	14.00 to 14.50
Heavy breakable cast	10.00 to 10.50
No. 2 railroad wrought ..	12.50 to 13.00
Hvy. steel axle turnings ..	11.00 to 11.50
Machine shop turnings ..	7.50 to 8.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers ..	15.75 to 16.25
Railr. coil and leaf springs ..	15.75 to 16.25
Rolled steel wheels	15.75 to 16.25
Low phos. billet and bloom ends	18.00 to 18.50
Low phos. mill plates	15.00 to 16.00
Low phos. light grades	15.00 to 16.00
Low phos. sheet bar crops ..	16.50 to 17.00
Heavy steel axle turnings ..	11.00 to 11.50
Electric Furnace Grades:	
Low phos. punchings	15.00 to 16.00
Heavy steel axle turnings ..	11.00 to 11.50
Blast Furnace Grades:	
Short shoveling steel turnings ..	8.00 to 8.50
Short mixed borings and turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Rolling Mill Grades:	
Steel car axles	18.00 to 18.50
Cupola Grades:	
No. 1 cast	12.00 to 13.00
Rails 3 ft. and under	14.00 to 14.50

CHICAGO

Steel Orders Increase in Anticipation of Price Rise, But Output is Off

CHICAGO, April 7.—Sales of finished steel products during the last week of March were the heaviest in four months, as a result of announcements of price advancements that were to take effect at the opening of April. Neither semi-finished nor rail tonnages figured to any appreciable extent in the total volume. Future commitments under these conditions, and at a time like this, are on the whole virtually meaningless. It is the rate of consumption that is all important, and therefore it is only of passing interest that recent sales have been equal to some of the best weeks in 1930.

Ingot output in this district has dropped at least two points to an average rate of 55 per cent of capacity. This is less significant than it might appear to be for the reason that consumers are consistently avoiding laying in stocks, and, since their business is variable, their needs for steel fluctuate rather rapidly. Accordingly, it is very much a matter of how orders fall from week to week. For instance, sheet production at the end of March stood near 70 per cent of capacity, while today the rate is not above 55 per cent, with producers expecting an upward turn soon. Specifications for steel mill products were by a small margin the heaviest in a month and among the best for any week so far this year.

Agricultural machinery builders are near the end of their spring manufacturing season and must now turn attention to such export trade as will develop this summer and the prospects that appear for production schedules next fall. Although structural business at the moment is light, fabricators are busy estimating, and large tonnages are piling up ahead of the industry.

PIC IRON

March was the fourth consecutive month in which shipments of Northern iron showed an increase and, if current releases are a true indicator for the remaining weeks in April, this month will also show an uptrend. The use of malleable iron is somewhat larger as automobile manufacturers slowly expand output. Four local merchant stacks are blowing, but output is not at rated capacity. Furnace stocks of iron show little variation from week to week. There is as yet no word of boat iron to be moved from Lake Erie ports to the Chicago district. There is still some boat iron on local docks, on which is also stored a tonnage of silvery brought by boat in the last half of 1930. A few spot sales of Southern

▲ ▲ ▲
Sales of finished steel heaviest in four months, mostly because of rise in price of bars, shapes and plates, effective April 1.

* * *
Ingot output, however, drops to 55 per cent of capacity. Sheet mill schedules decline most sharply.

* * *
Pig iron shipments gained in March for fourth consecutive month. Indications point to further gain this month.

* * *
Scrap supplies increase with coming of spring, and market continues very weak.

▼ ▼ ▼
iron are reported at \$11 a ton, Birmingham, or \$17.01, delivered Chicago.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.03
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	\$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos., sil. 1 to 2, cop-per free	28.50 to 29.20
Silvery, sil. 8 per cent	26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

FERROALLOYS

This market is stagnant as to new purchases. Contract users are entering moderate specifications.

CAST IRON PIPE

With the coming of warmer weather, releases against commitments at foundries are much freer. Shipments to the Chicago area are growing rapidly, and even the Northwest is taking pipe liberally in proportion to orders placed. This applies principally to public work, which is of fairly good size. However, contractors have found business very dull and their prospects for the spring and summer are far from bright. Detroit is reported to have awarded 2400 tons of 12-in. pipe to an unnamed bidder, and Milwaukee has placed 200 tons of 24 to 54-in. special castings with the George T. Fritz Foundry & Machine Co., St. Louis. Altoona, Iowa, is in the market for 180 tons of 4 to 8-in.

pipe. Fort Wayne, Ind., is a prospective purchaser of a large tonnage for a water treating plant. This week is rather quiet as to large inquiries, but small lots are more numerous than at the end of March.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$43 to \$44; 4-in., \$46 to \$47; Class A and gas pipe, \$3 extra.

RAILS AND TRACK SUPPLIES

Three sales of standard-section rails total 1500 tons. The market is quiet otherwise, except for a rather steady run of specifications, which are holding rolling schedules to a uniform range between 50 and 55 per cent of capacity. The Milwaukee Road's contemplated purchase of 23,000 tons is inactive at present, but from all reports it is not far in the future. Orders for track accessories for second quarter delivery total 2000 tons. The tonnage of track bolts moving this spring is small when compared with shipments of splice bars and tie plates. This is accounted for by the closer attention that railroads are paying to reclaiming old material and also the fact that the use of 39-ft. rails makes fewer bolts necessary. The light rail market is quiet, with sales confined to single carloads and smaller tonnages.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.40c. to 2.50c.; No. 24 galv., 3.00c. to 3.10c.; No. 10 blue ann'd, 2.00c. to 2.10c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

BOLTS, NUTS AND RIVETS

Consumption of these commodities by manufacturers of farm equipment continues to dwindle as spring production schedules taper. Releases by automobile plants are steadily increasing.

SHEETS

The spotty character of demand is again in strong evidence, as indicated by hot mill output having dropped from almost 70 per cent to about 55 per cent in less than a week. Producers, however, do not take this as proof that demand is definitely pointed downward nor that a return to higher operations is not probable in the near future. It seems to be more a matter of chance as to how orders fall from week to week. The general practice among users is to avoid long-term commitments. Orders are usually placed for specific work and then sheets are not purchased again until the tonnage on hand has been fabricated. Prices in and near Chicago show a fair degree of stability, but

in outlying sections, especially to the east, concessions are quite common.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 1.95c.; angle bars, 2.75c.

WAREHOUSE BUSINESS

The curve of orders to warehouses has been pointing upward for about 10 days. Orders in the first week of April were the largest of the year thus far. Jobbers recall that in 1922, the recovery year from the 1921 depression, warehouse orders took a sharp turn upward at about this period. A good deal of the current demand appears to be from the city, whereas a few weeks ago the bulk of business was from the country.

REINFORCING BARS

March was a quiet month in both sales and shipments. However, in the past week or 10 days there has been a substantial increase in inquiries, and this situation, together with road programs, gives a brighter tone to the market. Estimators are busier than at any time since the first of the year on a large number of small but at the same time attractive inquiries.

Road construction programs will be in full swing by mid-April. It is estimated that fully 3000 tons of reinforcing bars are to move for this purpose from local warehouses. Illinois has announced low bidders on some new work, and plans for additional mileage are in the making. Prices for rail steel bars for road work are holding at 1.65c. a lb., local warehouse, and quotations on culvert work are 1.75c.

PLATES

The local plate market is enlivened by an inquiry for 5000 tons for oil storage tank construction. There is little new in the pipe line field except that the Gulf Pipe Line Co. has started work on a 51-mile line of 8-in. pipe, which will extend from Dublin, Ind., to Cincinnati. Chicago district producers have advanced plates to 1.80c. a lb.

BARS

Bar sales and specifications are following the general trend of the market. Sales at the end of the first quarter mounted sharply to the best this year, influenced by the prospective advance to 1.80c. a lb., Chicago, on April 1. Specifications are amply supporting bar mill output at the general average of ingot production in this district. Second quarter contracts for iron bars are in fair volume. Greater activity at railroad shops is resulting in larger specifications. Iron bar prices have been advanced to 1.80c. a lb., Chicago. The alloy steel bar market has shown no change since the end of March. Specifications for rail steel bars are the heaviest in three or four months. New buying is slow, with prices un-

changed at 1.60c. to 1.65c. a lb., district mill. The barn equipment industry is quiet, though several concerns in it have entered new contracts.

STRUCTURAL MATERIAL

Fabricators are consistent in their reports that they are estimating a far more satisfactory volume of work. However, most tonnages are small. There is some industrial work, but most of the estimates are on bridges and public work. Practically nothing is in the market in the way of investment type structures. It is estimated that fully 55,000 tons is now being figured. This includes some large public work, but does not take in the elevated structures, which in a two-year program will require upward of 75,000 tons, and the more than 20,000 tons needed by the Chicago South Park Commission.

WIRE PRODUCTS

Specifications at the end of March showed marked improvement, not, however, because of greater consumption, but for the reason that contracts were being closed out at the end of the quarter. Jobbers continue to move cautiously and in only a few instances have they taken on additional stocks to meet spring demand. Consumption of nails is small, notwithstanding that residential building is gaining slowly in volume. It is of interest that special rolled sections are coming into greater use, thereby eliminating much lumber and the necessary nails. Trade is developing well in the Northwest, which at the moment is about as active as any section in the country. Concrete mesh is moving faster, but the expected heavy call for shipments is not yet at hand. Wire mill output remains at 40 to 45 per cent of capacity.

COKE

Chicago by-product foundry coke is steady at \$8 a ton, local ovens, in a very quiet spot market. March ship-

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.00c.
Soft steel bars	2.90c.
Reinforcing bars, billet steel.....	2.00c.
Rail steel reinforcement.....	1.50c. to 1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.35c.
Flats and squares.....	3.85c.
Bands, $\frac{7}{8}$ in. (In Nos. 10 and 12 gages).....	3.10c.
Hoops (No. 14 gage and lighter).....	3.65c.
Black sheets (No. 24).....	3.80c.
Galv. sheets (No. 24).....	4.35c.
Blue ann'l'd sheets (No. 10).....	3.35c.
Spikes ($\frac{3}{4}$ in. and larger).....	3.45c.
Track bolts	4.30c.
Rivets, structural.....	4.00c.
Rivets, boiler.....	4.00c.
	Per Cent Off List
Machine bolts .....	.60 and 10
Carriage bolts .....	.60 and 10
Coach and lag screws.....	.60 and 10
Hot-pressed nuts, sq., tap. or blank.....	.60 and 10
Hot-pressed nuts, hex., tap. or blank.....	.60 and 10
No. 8 black ann'l'd wire, per 100 lb.....	\$3.45
Com. wire nails, base per keg.....	2.30
Cement c't'd nails, base per keg.....	2.30

ments showed moderate gain over those of February, and releases already entered this month point to further improvement in shipping schedules.

OLD MATERIAL

About 10,000 tons of heavy melting steel has been purchased at \$10.25 a gross ton, delivered, Gary. This sale is about the only encouraging feature of the market. Warmer weather is bringing out more scrap and consumption is not keeping pace with the increase in available supplies. Railroad offerings are growing in number and size, and little time is lost in bringing cars on tracks. Most electric furnaces are on part time operations and the movement of low phosphorus grades is very slow. Consumers of these grades had expected a heavier melt by this time and, accordingly, they bought rather freely earlier in the year. Prices of many grades remain untested by sales to consumers. Trades by dealers point to weakness in some sections of the list.

Prices deliv'd Chicago district consumers:

	Per Gross Ton
Basic Open-Hearth Grades:	
Heavy melting steel.....	\$9.75 to \$10.25
Shovelling steel	9.75 to 10.25
Frogs, switches and guards, cut apart, and misc. rails	9.75 to 10.25
Factory hyd. comp. sheets	8.00 to 8.50
Drop forge flashings.....	6.75 to 7.25
No. 1 busheling.....	7.75 to 8.25
Forg'd cast and r'l'd steel carwheels	12.50 to 13.00
Railroad tires, charg. box size	12.50 to 13.00
Railroad leaf springs cut apart	12.25 to 12.75
Axle turnings	8.50 to 9.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	11.00 to 11.50
Coil springs	12.50 to 13.00
Electric Furnace Grades:	
Axle turnings	8.75 to 9.25
Low phos. punchings.....	11.00 to 11.50
Low phos. plates, 12 in. and under	11.25 to 11.75
Blast Furnace Grades:	
Cast iron borings	4.75 to 5.00
Short shovelling turnings.....	4.50 to 5.00
Machine shop turnings.....	4.50 to 5.00
Rolling Mill Grades:	
Rerolling rails	12.00 to 12.50
Cupola Grades:	
Steel rails, less than 3 ft.....	11.50 to 12.00
Steel rails, less than 2 ft.....	12.50 to 13.00
Angle bars, steel	11.00 to 11.50
Cast iron carwheels.....	9.50 to 10.00
Malleable Grades:	
Railroad	11.50 to 12.00
Agricultural	10.75 to 11.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.....	19.00 to 21.00
*Relaying rails, 65 lb. and heavier	22.00 to 27.00
	Per Net Ton
Rolling Mill Grades:	
Iron angle and splice bars.....	9.75 to 10.25
Iron arch bars, and transoms	10.50 to 11.00
Iron car axles	18.00 to 19.00
Steel car axles	12.75 to 13.25
No. 1 railroad wrought.....	8.25 to 8.75
No. 2 railroad wrought.....	8.75 to 9.25
No. 1 busheling.....	6.00 to 6.50
No. 2 busheling.....	4.00 to 4.50
Locomotive tires, smooth.....	11.50 to 12.50
Pipes and flues	5.50 to 6.00
Cupola Grades:	
No. 1 machinery cast.....	9.50 to 10.00
No. 1 railroad cast.....	8.50 to 9.00
No. 1 agricultural cast.....	8.00 to 8.50
Stove plate	7.00 to 7.50
Grate bars	7.00 to 7.50
Brake shoes	7.75 to 8.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

CLEVELAND

Lessening of Demand for Steel Brings Curtailment of Mill Operations

CLEVELAND, April 7.—Demand for finished steel has not been as brisk the past week as during the last week of March. However, some specifications came out against the new contracts for bars, plates and shapes taken at \$1 a ton advance over the first quarter contract price. Most consumers have covered for these products for the quarter, although there was some resistance to the advance.

While producers announced April 1 as the deadline date for taking contracts at 1.65c., Pittsburgh, for the heavier hot-rolled products, some extended the time a few days. While the asking price is now 1.70c., it is not yet certain that buyers not under contract will be obliged to pay more than 1.65c. except on very small lots.

Demand for tubular goods has become somewhat more active. Orders placed during the week included 800 tons for gas lines in Southern municipalities. Among contemplated projects is a gas pipe line in Montana, which, it is stated, will require 120 miles of 8-in. pipe or 7500 tons.

Steel plant operations in Cleveland were curtailed this week by the shutting down of two open-hearth furnaces by one producer and one by another. These plants are now operating at 59 per cent of ingot capacity, a loss of eight points for the week. Operation of local finishing mills has also been curtailed. While orders for sheets and hot-rolled strip are hardly holding up to recent volume, independent mills are maintaining recent operations of 51 per cent for black and full-finished sheets and 53 per cent for hot-rolled strip. Cold-rolled strip production has declined to 38 per cent of capacity, compared with 40 per cent two weeks ago.

PLATES, SHAPES AND BARS

Most consumers of steel bars in this territory have placed contracts at 1.70c., Cleveland, for the second quarter and a local producer is still naming that price to those who have not made contracts. While this price applies to merchant bars, there is uncertainty as to the price of reinforcing bars. Jobbers specified rather freely for these against 1.60c. first quarter contracts, and no new business of sufficient size has been quoted on to test the price for the current quarter. Demand for bars from industrial plants is only fair. Manufacturers of road-building machinery continue to take a good tonnage. In the building field there is considerable activity in small lots of structural shapes, but inquiries for lots of 100 tons and over are scarce.

PIG IRON

The recent slight improvement in sales is being maintained. Much of the demand is coming from foundries that have used up all the iron covered on first quarter contracts and are covering either for the current quarter or for April requirements. A Canton, Ohio, foundry inquired for 500 tons and this is understood to have been placed. A few inquiries are pending in lots up to 1000 tons. Orders generally are small. Shipping orders so far issued indicate that April shipments will show a slight gain over those of March. Demand from foundries outside of the motor car industry continues slow. Prices are unchanged at \$16 to \$17, Lake furnace, for foundry and malleable iron. In Michigan, \$17 to \$17.50 is quoted. For Cleveland delivery, the price is \$17, furnace.

Prices per gross ton at Cleveland:	
N'th'n fdy., sil. 1.75 to 2.25	\$17.00
S'th'n fdy., sil. 1.75 to 2.25	\$16.51 to 17.01
Malleable	17.50
Ohio silvery, 8 per cent	25.00
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

IRON ORE

Naming of prices for this season is expected during the present week. The only inquiry of size pending is that of the Ford Motor Co. Shipments from Lake Erie ports during March amounted to 246,295 tons, as against 451,046 tons during the same month last year. The dock balance April 1 was 5,765,281 tons, against 5,092,264 tons on the same date a year ago.

SHEETS

Demand fell off slightly the past week. Some of the automobile manufacturers in the Detroit territory are reported to have been receiving shipments in larger volumes than warranted by present production schedules and are taking steel in some-

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.85c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.40c.
Cold-fin. flats and sq.	3.90c.
Hoops and bands, No. 12 to 14 in., inclusive	3.10c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	5.95c.
Black sheets (No. 24)	3.60c.
Galvanized sheets (No. 24)	4.00c.
Blue ann'l'd sheets (No. 10)	3.10c.
No. 9 ann'l'd wire, per 100 lb.	\$2.35
No. 9 galv. wire, per 100 lb.	2.80
Com. wire nails, base per keg	2.25

*Net base, including boxing and cutting to length.

what less volume than recently. Some fair tonnages came out from other sources for deliveries extending through the second quarter. Orders for metal furniture sheets have declined somewhat. Demand from other consuming industries remains moderate. Black sheets generally have settled to 2.25c., Pittsburgh, although a little business is still being taken at 2.35c. On metal furniture sheets 3.50c. is now regarded as the market, these having declined with black sheets. Galvanized sheets lack strength, there being reports of concessions of \$1 to \$2 a ton from the 2.90c. price.

WIRE PRODUCTS

The 2.30c. price on manufacturers' wire is being maintained in spite of pressure to secure concessions. Contracting for wire products for the second quarter has been light.

STRIP STEEL

Mills are getting a moderate volume of business in hot-rolled strip, mostly in small lots. While 1.55c. for wide strip and 1.65c. for narrow are now generally recognized as the ruling prices for car lots and over, several of the mills are holding to \$2 a ton higher for less than car lots. Cold-rolled strip appears to be stabilized at 2.25c., Cleveland, except for small lots, on which 2.35c. is the ruling price.

OLD MATERIAL

The market continues to drag, with activity limited to small-lot purchases by dealers for shipment to the Youngstown district. Mills in that district, as well as a local consumer, are still restricting shipments.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	\$10.00 to \$10.50
No. 2 heavy melting steel	9.75 to 10.00
Compressed sheet steel	9.25 to 9.50
Light bundled sheet stampings	7.50 to 7.75
Drop forge flashings	8.00 to 8.50
Machine shop turnings	5.00 to 5.50
Short shoveling turnings	7.00 to 7.25
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	10.00 to 10.50
No. 1 bushelling	8.50 to 9.00
Pipes and flues	5.50 to 6.00
Steel axle turnings	9.50 to 10.00
Acid Open-Hearth Grades:	
Low phos., billet bloom and slab crops	16.50 to 17.00
Blast Furnace Grades:	
Cast iron borings	7.00 to 7.50
Mixed borings and short turnings	7.00 to 7.50
No. 2 bushelling	6.25 to 6.50
Cupola Grades:	
No. 1 cast	12.00 to 12.50
Railroad grate bars	6.00 to 6.50
Stove plate	6.00 to 6.50
Rails under 3 ft.	15.00 to 15.50
Miscellaneous:	
Rails for rolling	15.00 to 15.50
Railroad malleable	12.50 to 13.00

NEW YORK Steel Orders Continue Slow Gains—Pig Iron Market Lacks Vitality

NEW YORK, April 7.—Pig iron demand continues to lack vitality, and foundry melt shows no convincing signs of improvement. Seldom has the pig iron market in this territory been consistently dull for so long a period. Inquiries are few and in most instances are uncovered only after thoroughly canvassing the trade. Pending business, including tentative inquiries, does not exceed 3000 tons. Sales for the week total 6000 tons, compared with 5000 tons in the previous week and 8000 tons two weeks ago.

Although the State Barge Canal officially opened April 6, actual resumption of navigation is delayed by high water. However, no large barge movement of pig iron from Buffalo is in early prospect, since winter stocks accumulated at New Jersey ports have not been entirely disposed of.

Price competition is still severe, although current orders have not been sufficiently large to bring out any new low figures.

Prices per net ton deliv'd New York:
Water pipe, 6-in. and larger, \$34.90 to \$36.90; 4-in. and 5-in., \$37.90 to \$39.90; 3-in., \$44.90 to \$46.90. Class A and gas pipe, \$3 extra.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	\$19.91 to \$20.41
*Buff. No. 2, del'd east N. J.	18.28 to 18.78
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	17.39 to 17.89
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

WAREHOUSE BUSINESS

While black and galvanized sheet prices are being fairly well maintained, with only occasional concessions, bars and shapes are subject to shading as a result of continued competition from imported material. Business has improved somewhat in recent weeks, but the total volume is still well under the usual tonnage moving from jobbers' stocks at this season.

REINFORCING BARS

Distributors continue to quote 1.65c., Pittsburgh, or 1.98c., delivered, but on the larger projects direct shipment from the mill is sometimes offered at concessions from this price of \$1 and more a ton. The largest new reinforced concrete project in this district is a cold storage warehouse for the New York Central Railroad, which is expected to require more than 500 tons of bars.

FINISHED STEEL

Aside from a falling off in demand for steel sheets, due, perhaps, to an uncertain price situation, orders received by local sales offices for various steel products are at least holding their own, and some gains have been recorded. Nearly all companies had a larger volume in March than in February. Specifications of bars, shapes and plates have gained somewhat, as a number of mills have permitted their customers to order against lower-priced first quarter contracts during the first week or 10 days of April.

Public work continues to predominate in the large tonnages of structural steel. The Phoenix Bridge Co. was low bidder on 15,000 tons for a section of an elevated highway in New Jersey; bids are to be taken soon on 38,000 tons additional for the same project. The New York Central will come into the market soon for 10,000 tons for a section of the West Side elevated highway, New York.

Bids were opened Monday by the New York Central on its second quarter steel requirements. Quotations on bars, shapes and plates were at variance. On plates, for example, there were quotations of 1.65c., Youngstown; 1.65c., Granite City, Ill.; 1.65c., Cleveland, and 1.83c., delivered New York. The Carnegie Steel Co. bid 1.70c., Youngstown, for Western

shops, and 1.80c., West Seneca, N. Y., for Eastern shops, while Illinois Steel Co. bid 1.80c., Chicago; Inland Steel Co. bid 1.70c., Indiana Harbor, Ind. Jones & Laughlin Steel Corp. bid 1.70c., Youngstown, and 1.80c., West Seneca. Sheet prices also showed some variations, with 1.85c. to 1.90c., shipping point, quoted on No. 10 blue annealed and 2c. to 2.05c. on No. 13 gage.

Tenders taken April 6 by the New Jersey State Highway Commission on 15,500 tons of fabricated structural steel for completing link section 4A, route 25, disclosed the Phoenix Bridge Co. as low bidder with a figure of \$1,672,352.50. The high bidder was the American Bridge Co., with a tender of \$1,941,921.50.

CAST IRON PIPE

Inquiry for pressure pipe is generally limited to small lots, seldom exceeding 100 tons. Competition among sellers is keen, resulting in quotations of \$32 to \$33 a net ton, f.o.b. foundry, on most business.

OLD MATERIAL

No. 1 heavy melting steel is inactive except for purchases at \$7.50 a ton, f.o.b. barge, New York, for delivery to Buffalo, and transactions in No. 2 steel are confined to small shipments being made to a Phoenixville, Pa., consumer, and occasional shipments to a Pittsburgh district mill at \$11 a ton, delivered, or \$5.70, New York. The consumer of No. 2 steel at Conshohocken, Pa., and the mills using No. 1 heavy melting steel at Coatesville, Pa., and Claymont, Del., are still postponing deliveries on contracts. Offers of No. 1 heavy melting steel to eastern Pennsylvania consumers at \$10.50 a ton, delivered, have not been accepted.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel..	\$6.50 to \$7.50
Heavy melting steel (yard)	5.00 to 5.25
No. 1 hvy. breakable cast..	6.75 to 7.50
Stove plate (steel works)...	4.75 to 5.00
Locomotive grate bars....	4.75 to 5.00
Machine shop turnings....	3.50
Short shoveling turnings...	3.50
Cast borings (blast fur. or steel works)	3.50
Mixed borings and turnings	3.00
Steel car axles.....	13.00 to 14.00
Iron car axles	17.00 to 17.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.25
Forge fire	6.50 to 6.75
No. 1 railroad wrought...	8.75
No. 1 yard wrought, long...	7.75
Rails for rolling.....	9.25 to 9.75
Stove plate (foundry)...	5.50 to 6.00
Malleable cast (railroad)...	9.00 to 9.50
Cast borings (chemical)...	8.50 to 9.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast.....	\$12.50
No. 1 hvy. cast (columns, bldg. materials, etc.)	10.50
No. 2 cast (radiators, cast boilers, etc.)	10.00

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and struc. shapes....	2.70c. to 3.10c.
Soft steel bars, small shapes...	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal....	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons.....	3.40c.
Flats and squares.....	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Blue ann'l'd sheets (No. 10)...	3.00c. to 3.25c.
Black sheets (No. 24*).....	3.50c.
Galvanized sheets (No. 24*).....	4.00c.
Long terme sheets (No. 24).....	5.00c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galv. annealed.....	5.15c.
Tire steel, 1/2 x 1/2 in. and larger..	3.40c.
Smooth finish, 1 to 2 1/2 x 1/4 in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
3/4 x 6 in. and smaller..	.65 to .65 and 10
1 x 30 in. and smaller..	.65 to .65 and 10
Carriage bolts, cut thread:	
3/4 x 6 in. and smaller..	.65 to .65 and 10
3/4 x 20 in. and smaller..	.65 to .65 and 10
Boller Tubes:	Per 100 Ft.
Lap welded, 2-in.....	\$19.00
Seamless steel, 2-in.....	20.25
Charcoal iron, 2-in.....	26.25
Charcoal iron, 4-in.....	67.00

PHILADELPHIA

Steel Buying Light—Some Price Protections Extended

PHILADELPHIA, April 7.—Failure of spring buying of steel to expand to the extent that had been hoped for has created an undertone of uncertainty among steel sellers. While there has been no decided reduction in the volume of incoming orders, operating schedules have been revised downward in some instances. The leading independent interest is operating at a few points below its engagement of a few weeks ago. On the other hand, one of the Eastern plate mills is running at fully 75 per cent this week as a result of a rush of specifications against expiring first quarter contracts.

Contracting for second quarter has been smaller than at the beginning of the year. In some instances price protections for specific projects have been extended for two weeks to a month. On such contracts as have been closed, the ruling prices have been 1.75c., Coatesville, for plates and 1.65c., Pittsburgh, for bars. Inquiry for sheets is fair.

Public projects are contributing most of the larger business in the market, such as aircraft hangars for the Government requiring about 13,000 tons of structural steel, which will be fabricated in this district, probably of material furnished by the leading interest. Steel scows for the American Dredging Co., Philadelphia, requiring about 4000 tons of plates and 1200 tons of shapes have been placed with a Pittsburgh company, which is expected to assemble the material at its Wilmington, Del., plant, following fabrication in Pittsburgh.

STEEL BARS

Contracting for second quarter delivery has been limited. Short extensions of first quarter contracts have been granted to consumers. The current quotation on new business is 1.65c., Pittsburgh, or 1.94c., Philadelphia. Billet steel reinforcing bars are quoted at 1.65c., Pittsburgh, or 1.94c., Philadelphia, and on sizable tonnages this price is sometimes shaded \$1 a ton and more. Rail steel bars are 1.30c. to 1.35c., Pittsburgh, or 1.69c. to 1.74c., Philadelphia. Reinforced concrete projects include about 300 tons in a Philadelphia sewer project and 140 tons for a sewage disposal plant in Burlington, N. J.

PIG IRON

Quotations on eastern Pennsylvania foundry iron lack firmness when a substantial tonnage is offered, but, with most of the current buying limited to lots of one or two carloads, \$17, furnace, is the price on a substantial part of the business. Southern foundry iron is quoted at \$11, furnace, for small and medium-sized orders, but on the larger lots, such

as pipe shops usually buy, \$10.50, Birmingham, is obtainable. A northern New York furnace, which has sold about 40,000 tons of pig iron in this district in the past two weeks, is understood to have taken all of this business from pipe manufacturers, one having bought about 25,000 tons and another about 15,000 tons. A basic user in this district has contracted for 5000 tons from an eastern Pennsylvania furnace for delivery over the rest of this year.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$17.76 to \$18.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	18.26 to 18.76
East. Pa. No. 1X, 1.75 to 2.25 sil.	18.76 to 19.26
Basic (del'd east. Pa.)	17.25 to 17.50
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

PLATES

About 4000 tons of plates are required for barges to be built by the Dravo Contracting Co., Pittsburgh, for the American Dredging Co., Philadelphia. The quotation on new plate business is 1.75c., Coatesville, or 1.85½c., Philadelphia, but contracting has been light. Where protections on price have been given for certain projects, extensions of two weeks to a month are being granted by sellers.

SHAPES

On small tonnages of shapes the current quotation is 1.75c., nearest mill to consumer, or 1.81c., Philadelphia, but 1.70c., mill, or 1.76c., Philadelphia, has not entirely disappeared on the larger and more desirable specifications. In addition, price protections for specific projects have been extended into the early part of this quarter. Fabricating shops are

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.50c. to 2.60c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ¼-in. inclu.	2.90c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.60c.
†Galvanized sheets (No. 24)	4.15c.
Light plates, blue annealed (No. 10)	3.05c.
Blue ann'd sheets (No. 13)	3.20c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 40 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

bidding on some public projects, but private enterprises are limited.

WAREHOUSE BUSINESS

Prices are subject to some concessions, especially on bars and shapes. While the volume of buying from stock was slightly better in March than in February, the total of business is estimated by jobbers at 50 to 60 per cent of normal for this season.

SHEETS

Inquiry has been slightly more active with certain mills, but most new business is in small lots and prices continue irregular. Black sheets range from 2.25c. to 2.30c., Pittsburgh, or 2.54c. to 2.59c., Philadelphia, and galvanized from 2.80c. to 2.85c., Pittsburgh, or 3.09c. to 3.14c., Philadelphia. Blue annealed sheets in the wider specifications are fairly well maintained at 2.05c., Pittsburgh, or 2.34c., Philadelphia, and blue annealed plates are 1.90c., Pittsburgh, or 2.19c., Philadelphia. On the narrower widths, where competition is encountered from the product of the continuous mill, concessions of \$1 to \$2 a ton are not uncommon.

IMPORTS

In the week ended April 4, 1938 tons of pig iron arrived at this port from British India. Steel imports consisted of 450 tons of steel strips from France and 66 tons of structural shapes and 12 tons of bars from Belgium.

OLD MATERIAL

Except for shipments of machine shop turnings and No. 2 steel to a consumer at Phoenixville, Pa., the market is inactive, transactions being limited to occasional carloads of special grades of scrap.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$10.00 to \$11.00
No. 2 heavy melting steel	9.00
Heavy melting steel (yard)	8.50
No. 1 railroad wrought	11.50 to 12.00
Bundled sheets (for steel works)	9.00
Hydraulic compressed, new	9.00 to 10.00
Hydraulic compressed, old	8.00 to 8.50
Machine shop turnings (for steel works)	7.50
Heavy axle turnings (or equiv.)	9.50 to 10.00
Cast borings (for steel works and roll. mill)	7.50
Heavy breakable cast (for steel works)	11.00
Railroad grate bars	9.00
Stove plate (for steel works)	9.00
No. 1 low phos. hvy. (0.04% and under)	16.50 to 17.50
Couplers and knuckles	15.00 to 15.50
Roller steel wheels	15.00 to 15.50
No. 1 blast f'nace scrap	6.00 to 6.50
Wrot. iron and soft steel pipes and tubes (new specific.)	11.50 to 12.00
Shafting	18.00
Steel axles	17.50 to 18.00
No. 1 forge fire	10.50
Cast iron carwheels	13.00 to 13.50
No. 1 cast	12.00 to 12.50
Cast borings (for chem. plant)	14.00 to 14.50
Steel rails for rolling	12.50 to 13.00

ST. LOUIS

Bridge Contract Calling for 7000 Tons of Steel Awarded

ST. LOUIS, April 7.—The first week of the second quarter of 1931 found only a light demand for pig iron from both Northern and Southern makers. While shipments during March showed an improvement over February, there is still said to be some unfilled contracts for first quarter shipment. Melters continue to buy only for immediate requirements, which are small. The market continues steady at unchanged prices.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	\$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

FINISHED MATERIAL

The contract for 7000 tons of structural steel for the East St. Louis approach to the St. Louis municipal bridge has been awarded to the Mississippi Valley Structural Steel Co. on its low bid of \$61.95 a ton. The award included 2500 to 3000 tons of plates, which will be furnished by the Granite City Steel Co. The Laclede Steel Co. has been awarded 100 tons of reinforcing bars each for a Veterans' Hospital addition at Indianapolis and a filtration plant at Grand Island, Neb.

The plate department of the Granite City Steel Co. is operating on a more satisfactory basis than for some time, as a result of recent barge lettings and the demand from plate fabricators. An improvement is noted in the demand for galvanized sheets by this company, and orders for blue annealed sheets and light plates are being received in fair volume. Prices are

Warehouse Prices, f.o.b. St. Louis

Base per Lb.	
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shaftings, screw stock	3.60c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.10c.
Galv. corrug. sheets	4.65c.
Structural rivets	4.15c.
Boiler rivets	4.15c.

Per Cent Off List	
Tank rivets, 3/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60 and 10
Carriage bolts	60 and 10
Lag screws	60 and 10
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60 and 10
Less than 200 lb.	50 and 10
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60 and 10
Less than 200 lb.	50 and 10

reported to be firm, with very little pressure by buyers to disturb present levels.

OLD MATERIAL

Orders for heavy melting steel, estimated at 3000 to 4000 tons, was placed by an East Side consumer with several dealers here at a price about 50c. a ton lower than had been previously quoted. This was the only sizable tonnage placed. Dealers are said to be fully covered on their sales of 4000 tons of heavy melting steel to another East Side mill the preceding week. Selected heavy melting steel is 50c. lower, and No. 1 and No. 2 are each 25c. lower than in the preceding week.

Railroad lists: Baltimore & Ohio, 6345 tons; Chicago & North Western, 80 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	\$9.00 to \$9.50
No. 1 heavy melting or shoveling steel	8.50 to 9.00
No. 2 heavy melting or shoveling steel	8.00 to 8.50
No. 1 locomotive tires	10.00 to 10.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	9.25 to 9.75
Railroad springs	11.50 to 12.00
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 busheling	6.00 to 6.50
Cast iron borings and shoveling turnings	5.75 to 6.25
Iron rails	8.00 to 8.50
Rails for rolling	10.50 to 11.00
Machine shop turnings	3.00 to 3.50
Heavy turnings	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron car axles	19.00 to 19.50
Wrot. iron bars and trans.	9.00 to 9.50
No. 1 railroad wrought	7.00 to 7.50
Steel rails, less than 3 ft.	12.00 to 12.50
Steel angle bars	9.00 to 9.50
Cast iron carwheels	8.75 to 9.25
No. 1 machinery cast	9.00 to 9.50
Railroad malleable	10.00 to 10.50
No. 1 railroad cast	8.75 to 9.25
Stove plate	7.00 to 7.50
Relay. rails, 60 lb. and under	16.00 to 16.50
Relay. rails, 70 lb. and over	20.00 to 21.00
Agricult. malleable	9.00 to 9.50

CINCINNATI

Sheet Steel Demand Revives— Pig and Scrap Markets Dull

CINCINNATI, April 7.—Pig iron buyers are taking only enough material to meet current requirements. Local foundries are operating on short schedules in keeping with the slow demand. Operations of automotive foundries are at a better rate than those of machine tool foundries. Prices on all grades of iron are fairly steady. Two north central Ohio melters took 500 tons and 400 tons of Northern iron respectively last week. A central Ohio buyer is in the market for 500 tons of Northern foundry iron.

Prices per gross ton, deliv'd Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	\$14.19 to \$14.69
Ala. fdy., sil. 2.25 to 2.75	14.69 to 15.19
Tenn. fdy., sil. 1.75 to 2.25	14.19 to 14.69
S'th'n Ohio silvery, 8 per cent	24.39

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

FINISHED STEEL

Sheet steel demand has revived. The leading independent reports that last week's business was the best of the year. Orders continue to come from virtually all the sheet consuming industries. Buying, however, is mostly on a two weeks' basis. Operations of district mills continue at above 50 per cent. With demand again improving, better schedules are expected.

OLD MATERIAL

With shipments slow and new business scarce, local scrap iron dealers last week reduced prices on heavy melting steel, No. 2 wrought, sheet clippings, bundled sheets and busheling. There is no definite market

trend, as scrap users are marking time.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	\$8.75 to \$9.25
Scrap rails for melting	10.50 to 11.00
Loose sheet clippings	4.75 to 5.25
Bundled sheets	8.25 to 8.75
Cast iron borings	4.50 to 5.00
Machine shop turnings	4.50 to 5.00
No. 1 busheling	7.25 to 7.75
No. 2 busheling	4.25 to 4.75
Rails for rolling	11.50 to 12.00
No. 1 locomotive tires	10.00 to 10.50
No. 2 railroad wrought	8.75 to 9.25
Short rails	14.25 to 14.75
Cast iron carwheels	10.50 to 11.00
No. 1 machinery cast	14.00 to 14.50
No. 1 railroad cast	12.00 to 12.50
Burnt cast	6.50 to 7.00
Stove plate	6.50 to 7.00
Brake shoes	6.50 to 7.00
Agricultural malleable	11.00 to 11.50
Railroad malleable	12.00 to 12.50

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
New billet reforc. bars	3.15c.
Rail steel reforc. bars	3.00c.
Hoops	3.90c.
Bands	3.35c.
Cold-fin. rounds and hex.	3.80c.
Squares	4.30c.
Black sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.40c.
Blue ann'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	.60 per cent off list
No. 9 ann'd wire, per 100 lb.	\$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.	\$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

BIRMINGHAM

No General Pig Iron Buying Movement for Second Quarter

BIRMINGHAM, April 7.—Second quarter requirements of pig iron are being provided mostly by carry-over commitments from the first quarter and orders for early deliveries. There has been no general movement toward second quarter coverage. Many consumers continue to buy as needed or send shipping instruction on the same basis. Quotations continue at from \$12 to \$13 for delivery in the South. No change in furnace operations has taken place since March 28, when Woodward Iron blew in a third stack and increased the number of active furnaces in Alabama to 13.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil. \$12.00 to \$13.00
No. 1 fdy., 2.25 to 2.75 sil. 12.50 to 13.50
Basic 12.00 to 13.00

CAST IRON PIPE

The past week brought only routine business and the market has yet to feel the usual pressure of spring buying. March shipments showed a gain of about 10 per cent over February. Plant operations are about 65 per cent. Quotations continue at \$35 to \$36, base.

FINISHED STEEL

Steel tonnage from week to week is running about the same. New orders of the structural fabricators are mostly for small tonnages. Open-hearth operations are unchanged from last week, with the Tennessee company operating 13 and the Gulf States Steel three.

COKE

New inquiry is limited. Shipments are at about the first quarter rate. Contracts are being renewed without change. Quotations still are \$5. The Woodward Iron Co. increased from 130 to 160 ovens last week.

OLD MATERIAL

Dealers report a quiet market, without change in prices or in shipments.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....\$10.50 to \$11.00
Scrap steel rails..... 10.50
Short shoveling turnings... 9.00
Cast iron borings 8.50
Stove plate..... 8.50
Steel axles 19.00
Iron axles 18.00
No. 1 railroad wrought..... 10.00
Rails for rolling..... 11.50 to 12.00
No. 1 cast 11.00
Tramcar wheels 11.00 to 11.25
Cast iron borings, chem... 13.50
Cast iron carwheels..... 11.00

Hvy. steel axle turnings... 10.50 to 11.00
Machine shop turnings.... 5.50 to 6.00
No. 1 railroad wrought... 9.00 to 9.50

Acid Open-Hearth Grades:

Knuckles and couplers.... 13.50 to 14.00
Coil and leaf springs.... 13.50 to 14.00
Rolled steel wheels 13.50 to 14.00
Low phos. billet and bloom ends 15.00 to 15.50

Electric Furnace Grades:

Short shov. steel turnings... 8.50

Blast Furnace Grades:

Short mixed borings and turnings 7.00 to 7.25
Cast iron borings 7.00 to 7.25
No. 2 busheling 6.00

Rolling Mill Grades:

Steel car axles 15.00 to 15.50
Iron axles 16.00 to 16.50

Cupola Grades:

No. 1 machinery cast.... 10.00 to 10.50
Stove plate 9.25 to 9.50
Locomotive grate bars.... 8.25 to 9.25
Steel rails, 3 ft. and under 14.00 to 14.50
Cast iron carwheels..... 12.50 to 13.00

Malleable Grades:

Industrial 11.00 to 12.00
Railroad 11.00 to 12.00
Agricultural 11.00 to 12.00

Special Grades:

Chemical borings 9.50 to 10.00

YOUNGSTOWN

Recent Loss in Steel Tonnage Due to Automobile Industry

YOUNGSTOWN, April 6.—While specifications for finished steel products reaching Valley mills in the last two weeks have been in reduced volume, producers still believe that the upward movement in demand which continued rather steadily through the first quarter will be continued. Most of the recent loss in tonnage can be attributed to the automobile industry, and releases from this source may be resumed as suddenly as they were reduced, if the automobile trade finds spring sales of cars up to expectations. General demand for steel shows signs of improvement. Shipments of reinforcing bars, light structurals, wire products, galvanized material and tin plate have gradually improved during the past month.

The prospect for pipe, which was rather encouraging earlier in the year, is somewhat less satisfactory. Some of the large line pipe projects that were counted on to contribute considerable tonnage to tubular order books have been indefinitely postponed and other orders are being held up because of difficulties in financing. Fair production schedules on electric-weld pipe in the last two months have considerably reduced mill backlogs, and forward movements at the moment are not large. Demand for standard pipe has increased only slightly, and movement is far below normal seasonal expectations. Oil country goods are also dull.

Steel ingot production, which fell off rather sharply last week, will al-

BUFFALO Steel Operations Continue at Last Week's Rate—Pig Iron Shipments Fair

BUFFALO, April 7.—Sales of pig iron in this territory the past week totaled 3500 to 4000 tons. Of the 1300 tons recently purchased by the Worthington Pump & Machinery Corp., 500 tons was No. 1X, 300 tons No. 2X and 500 tons Bessemer. It is believed that only the No. 2X came to district furnaces. A textile concern in the East is inquiring for 1000 tons of foundry iron. Shipping directions have been very good. All of the iron sold this week was for prompt delivery.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25.....\$17.50
No. 2X fdy., sil. 2.25 to 2.75..... 18.00
No. 1 fdy., sil. 2.75 to 3.25..... 19.00
Malleable, sil. up to 2.25..... 18.00
Basic 17.50
Lake Superior charcoal..... 27.28

FINISHED STEEL

Operations of Buffalo mills remain about the same as a week ago. The Lackawanna plant of the Bethlehem Steel Co. is using 12 open-hearths; Republic Steel, three; Wickwire-Spencer, two, and Gould Coupler Co., one. The Seneca Iron & Steel Co. is operating at about 50 per cent. While only one sizable fabricated structural project is reported, a considerable volume of small jobs has been taken. A State highway bridge in Monroe

County was awarded to a local fabricator. The job involved 100 tons.

OLD MATERIAL

Few transactions are reported. Shipments are being freely made on old orders of No. 1 heavy melting steel. The market for stove plate has softened, with the market now at \$9.25 to \$9.50.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:
No. 1 heavy melting steel. \$11.00
No. 2 heavy melting scrap 9.50
Scrap rails 11.00
Hydraul. comp. sheet.... 9.50
Hand bundled sheets \$8.00 to 8.50
Drop forge flashings..... 9.50
No. 1 busheling 9.50

Warehouse Prices, f.o.b. Buffalo

Base per Lb.
Plates and struc. shapes..... 3.25c
Soft steel bars 3.15c
Reinforcing bars 2.95c
Cold-fin. flats and sq. 3.65c
Rounds and hex. 3.15c
Cold-rolled strip steel..... 5.85c
Black sheets (No. 24)..... 4.20c
Galv. sheets (No. 24)..... 4.60c
Bands 3.50c
Hoops 3.90c
Blue ann'l'd sheets (No. 10)..... 3.50c
Com. wire nails, base per keg..... \$2.60
Black wire, base per 100 lb..... 3.20

most hold its own this week, with slightly less than half of the independent open-hearth capacity of the district engaged. However, further curtailment will be necessary unless finishing mill requirements begin to gain in the near future. Production of tin plate is well maintained, but sheet mills are engaged at less than 45 per cent of capacity, and output of strip steel is considerably lower. The leading interest is running its bar mills at about 50 per cent of capacity, with the independents engaged at a slightly lower rate. Production of plates has improved slightly, but lighter demand for skelp from the pipe mills may check this upward movement soon. Blast furnace operations in the district are holding at recent levels.

Prices continue a matter of much concern to steel companies, but the widespread weakness in quotations on flat rolled products which was in evidence a fortnight ago is not so pronounced. Most of the larger users have contracted for their second quarter requirements at figures either unchanged or below first quarter billing quotations, and no further declines in the open market are in prospect. The situation with respect to bars and plates is more satisfactory, and Valley mills have succeeded in booking a fair amount of tonnage at 1.65c., Pittsburgh. In some cases it was necessary to extend old contracts at 1.60c. into the second quarter, but buyers entering new tonnage have largely been forced to pay the higher price. One company is now naming 1.70c., Pittsburgh, on plates and bars for spot tonnage, and this figure is strictly an asking price.

The market on raw materials is not changed materially. Sellers of pig iron are quoting \$17, Valley furnace, on the four principal grades of iron for sales in the immediate district, but competition has made prices on foundry and basic iron strictly nominal in outside territory. On a recent inquiry for 500 tons of basic iron, divergent quotations were received, and the tonnage apparently was not placed. The scrap market is dull, with compressed sheets notably weak. Although consumers are not inclined to make purchases, small tonnages could probably be placed at as low as \$12.

Federal Steel Sash Co., Waukesha, Wis., manufacturer of electric arc welded solid section steel windows, has opened a sales office at 2309 Union Central Building, Cincinnati, in charge of L. C. Krauss.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	2.50c.
Soft steel bars	2.50c.
Black sheets (No. 24)	4.15c.
Blue ann'd sheets (No. 10)	3.05c.
Galv. sheets (No. 24)	4.65c.
Struc. rivets, 1/2-in. and larger	5.00c.
Com. wire nails, base per keg	\$3.35
Cement c'd nails, 100 lb. keg	3.35

PACIFIC COAST

SAN FRANCISCO, April 4 (By Air Mail).—Sales and inquiries were not numerous this week, and the total tonnage booked was considerably below the weekly average for the year. Some strengthening is noted in the price structure in that there appears to be less inclination on the part of producers to cut prices.

The largest project awarded involved 416 tons of reinforcing steel bars for paving work in Monterey County, Cal. Bids have been opened on 525 tons of structurals and 120 tons of sheet steel piling for an overhead crossing at Essex over the Santa Fe tracks.

BARS

Demand for merchant steel bars has not improved. Quotations are unchanged at 2.10c., c.i.f. Among the reinforcing steel lettings were 107 tons for highway work in California, placed with the Truscon Steel Co., and 300 tons for a medical building in Pasadena, placed with an unnamed interest. Bids will be opened April 22 on 305 tons for a bridge in San Diego County. Prices are firm in the San Francisco district at 2.60c., base, on carload lots out-of-stock. In the Los Angeles district, 2.50c., base, appears firm.

PLATES

Bookings were confined to lots of less than 100 tons. New inquiries include 400 tons for four steel scows for the United States Engineer Office, Portland, and 300 tons for a floating steel derrick for the Mare Island Navy Yard. Prices continue at 2c. to 2.05c., c.i.f.

SHAPES

Structural awards were few. Dyer Brothers took 250 tons for the Science Building in Golden Gate Park, San

Steel Price Structure Strengthening in Western Markets

Pig iron prices per gross ton at San Francisco:

*Utah basic	.....\$22.00 to \$24.00
*Utah fdy., sil. 2.75 to 3.25	..... 22.00 to 24.00
**Indian fdy., sil. 2.75 to 3.25	..... 22.00 to 24.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Francisco, and McClintic-Marshall Corp. secured 120 tons for an apartment on Pacific Street, San Francisco. New inquiries involve small lots. Plain material is quoted at 2.05c. to 2.15c., c.i.f.

CAST IRON PIPE

Demand has fallen off. Bids have been opened on 135 tons of 6 to 12-in. Class B pipe for Glendora, Cal. The only new inquiry of importance calls for 2725 tons of 16 to 24-in. Class B pipe for Los Angeles, bids on which will be opened April 9.

TRACK MATERIAL

The Los Angeles Harbor Department awarded 215 tons of 128-lb. girder rails to the Pacific Coast Steel Corp. at \$45.38 a net ton. The Columbia Steel Co. secured the rail joints, nut locks and tie plates at \$3,170.24, and the Racor-Pacific Frog & Switch Co. received the award for the frogs and switches at \$19,945.95.

SHEETS

Movement of blue, black and galvanized sheets is confined mostly to lots of less than 100 tons. Owing to the fact that sheets are now produced both at Torrance and Pittsburgh, Cal., consumers are no longer carrying heavy stocks. Prices on blue annealed, No. 10 gage, black sheets, No. 24 gage, and galvanized sheets, No. 24 gage, c.i.f., are 2.50c., 3c. and 3.50c., base, respectively.

CANADA

Bridge Construction Features Structural Steel Market

TORONTO, April 7.—The Easter holiday season caused some interruption in pig iron business. The melt is gradually creeping up, and is now 10 to 20 per cent above that at the beginning of the year. Foundries are largely responsible for the improvement. Pig iron prices are unchanged.

Prices per gross ton:

	Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75	.....\$22.60
No. 2 fdy., sil. 1.75 to 2.25	..... 22.10
Malleable	..... 22.60
	Delivered Montreal
No. 1 fdy., sil. 2.25 to 2.75	.....\$24.00
No. 2 fdy., sil. 1.75 to 2.25	..... 23.50
Malleable	..... 24.00
Basic	..... 20.50

STRUCTURAL STEEL

Awards for bridge construction are maintaining structural steel sales at a good rate. Some good-sized orders for steel are pending, according to building programs announced. The largest project in the Toronto district calls for 5000 to 6000 tons for a 26-story building for the Bank of Nova Scotia.

OLD MATERIAL

The demand for scrap was featureless during the past week or 10 days, although a few consumers closed small orders. Some small shipments of steel scrap are being made to the mills in the Hamilton district. Iron

scrap continues in steady demand throughout Ontario and Quebec. Dealers are picking up machinery cast and odd lots of malleable, but otherwise are showing little interest in the market. Prices are unchanged.

Dealers' buying prices for old material:
Per Gross Ton

	Toronto	Montreal
Heavy melting steel.....	\$7.00	\$6.00
Rails, scrap.....	7.00	6.00
No. 1 wrought.....	6.00	8.00
Machine shop turnings....	2.00	2.00
Boiler plate.....	5.00	4.50
Heavy axle turnings.....	2.50	2.50
Cast borings.....	2.00	2.00
Steel borings.....	2.00	2.00
Wrought pipe.....	2.00	2.00
Steel axles.....	7.00	9.00
Axles, wrought iron.....	7.00	11.00
No. 1 machinery cast.....	10.00	10.00
Stove plate.....	8.00	8.00
Standard carwheels.....	8.50	8.50
Malleable.....	8.00	8.00
Per Net Ton		
No. 1 mach'ry cast.....	11.00	.....
Stove plate.....	9.00	.....
Standard carwheels.....	10.00	.....
Malleable scrap.....	9.00	.....

Freight Rate Decisions

WASHINGTON, April 7.—In a decision made public last Thursday, the Interstate Commerce Commission ordered a rate of 33 per cent of first class on structural steel from Neville Island, Blawnox, Leetsdale, Allentown and Bethlehem, Pa., and Roanoke, Va., to Hartford, Tenn., and Waterville and Mount Sterling, N. C., as well as other points in the Tennessee & North Carolina Railroad. The new rates, to become effective July 1, represent reductions. Reparation was awarded. Complaint was made against the rates by the Phoenix Utility Co., constructor of electric power stations and transmission systems.

Effective June 29, the Interstate Commerce Commission has ordered a rate of 94c. per 100 lb. on cotton ties from Atlanta, Ga., and a rate of 66c. per 100 lb., in straight or mixed carloads of cotton bagging and cotton ties from Galveston and Houston, Tex., to numerous points in New Mexico. The rates on cotton ties have ranged up to \$1.22, while rates on cotton bagging were as high as 85c.

The Interstate Commerce Commission has handed down a decision holding that the fifth class rate of 25.5c. per 100 lb. charged on 183 carloads of tin plate shipped after Nov. 26, 1926, from McKeesport, Pa., to Randolph, N. Y., was unreasonable to the extent it exceeded the commodity rate of 23c. Reparation was awarded on this basis. The commission said no finding for the future is necessary, since the rate becomes 22.5c. under the general iron and steel rate decision.

Arrangements have been completed between Pennsylvania Tank Line and Conley Tank Car Co., under which cars of the two companies will be operated in the future under the name of the Pennsylvania-Conley Tank Line. Headquarters have been established in the Koppers Building, Pittsburgh.

BOSTON

Pig Iron Sales Are Small—Scrap Market Unsettled

BOSTON, April 7.—Pig iron sales in this territory are small, having been in the past week only 1500 tons, of which the Mystic Iron Works took two-thirds. Sales included a small tonnage of charcoal iron at \$22 a ton, base, furnace, compared with \$24, at which the last previous sale was made in this territory. Small lots of Indian No. 2X were sold at \$19.25 and \$19.50 a ton, on dock here, duty paid. There are no open inquiries in the market, but one large consumer and a few small ones are sounding out the market quietly.

Foundry iron prices per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25..	\$19.91 to \$20.91
*Buffalo, sil. 2.25 to 2.75..	19.91 to 20.91
*Ala., sil. 1.75 to 2.25.....	20.11 to 20.61
*Ala., sil. 2.25 to 2.75.....	20.61 to 21.11
†Ala., sil. 1.75 to 2.25.....	16.75
†Ala., sil. 2.25 to 2.75.....	17.25

Freight rates: \$4.91 all rail from Buffalo; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

CAST IRON PIPE

The Warren Foundry & Pipe Co. was conspicuous in the market the past week. It sold 117 tons of 6-in. pipe and 80 tons of 8-in. to Walpole, Mass., and 100 tons of 12-in. to Reading, Mass. In addition, the company was the low bidder on 120 tons of 6-in., 250 tons of 8-in., 50 tons of 10-in. and 50 tons of 12-in., wanted by Malden, Mass., 250 tons of 6 to 12-in. required by Watertown, Mass., and on 10,000 ft. of 6 to 12-in., bids for which were asked by Revere, Mass. The United States Pipe & Foundry Co. took 246 tons of 12-in. and 33 tons of 6-in. from Natick, Mass. Car lot business aggregated about 300 tons, divided among these two foundries.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates.....	3.36 1/4c.
Structural shapes—	
Angles and beams.....	3.36 1/4c.
Tees.....	3.36 1/4c.
Zees.....	3.36 1/4c.
Soft steel bars, small shapes....	3.26 1/4c.
Reinforcing bars.....	3.11 1/4c. to 3.26 1/4c.
Iron bars—	
Refined.....	3.26 1/4c.
Best refined.....	4.60c.
Norway rounds.....	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth.....	5.00c. to 10.00c.
Crucible.....	12.00c.
Tire steel.....	4.50c. to 4.75c.
Bands.....	4.015c. to 5.00c.
Hoop steel.....	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....	3.50c. to 5.50c.
Squares and flats.....	4.00c. to 6.00c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.80c.
Per Cent Off List	
Machine bolts.....	.60 and 5
Carriage bolts.....	.60 and 5
Lag screws.....	.60 and 5
Hot-pressed nuts.....	.60 and 5
Cold-punched nuts.....	.60 and 5
Stove bolts.....	.70 and 10

dries and R. D. Wood & Co. and the Donaldson Iron Co. Somerset, Mass., has closed bids on 100 tons of 8-in. and 50 tons of 6-in., but has made no award. Provincetown, Mass., will buy a small lot of pipe.

REINFORCING STEEL

Awards the past week were about 1000 tons, including 700 tons for a Boston subway extension job, about 150 tons in small lots distributed among local concerns and 200 tons for various work in Connecticut. While billet bars are generally held at 3c. a lb. on one to five-ton lots from stock, 2.40c. on six to 99-ton lots, and 2.30c. on 100-ton and larger lots, the price on larger tonnages has been shaded. The market for rail steel bars is quiet. The quotation is 2.26 1/2c. a lb., delivered Boston rate points.

OLD MATERIAL

The weakness of prices in the Youngstown and Pittsburgh territories has thrown the local market into considerable confusion. Brokers profess to be at sea as to values, consequently have withdrawn all quotations except for Worcester, Mass., delivery. No. 1 heavy melting steel for Worcester delivery was sold last week at \$7.10 a ton, on cars shipping point, T rails at \$7.10, and long bundled skeleton at \$6.10. Some material on old contracts for Pennsylvania delivery was moved, but business otherwise was practically at a standstill. There is a market for breakable cast at \$6 to \$6.50 a ton, shipping point, but offerings are scarce.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel..	\$6.50 to \$7.10
Scrap T rails.....	6.50 to 7.10
Scrap girder rails.....	5.50 to 6.00
No. 1 railroad wrought....	7.00 to 7.50
Machine shop turnings....	2.00 to 2.50
Cast iron borings (steel works and rolling mill)	2.00 to 2.50
Bundled skeleton, long....	6.00 to 6.10
Forge flashings.....	5.50 to 6.00
Blast furnace borings and turnings.....	2.00 to 2.50
Forge scrap.....	5.00 to 5.50
Shafting.....	13.00 to 13.50
Steel car axles.....	14.00 to 15.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	6.50 to 7.00
Rails for rolling.....	8.50 to 9.00
Cast iron borings, chemical	9.00 to 9.60
No. 2 cast.....	5.10 to 5.60
Prices per gross ton delivered consumers' yards:	
Textile cast.....	\$9.00 to \$9.50
No. 1 machinery cast....	10.50 to 11.00
Stove plate.....	7.00 to 7.25
Railroad malleable.....	13.00 to 13.50

Shipments of enameled sheet metal ware in January totaled 267,232 doz., valued at \$985,756, compared with 250,568 doz., valued at \$873,906 in December, according to reports received by the Bureau of the Census from 15 manufacturers, representing approximately 80 per cent of the industry.

▲▲ Semi-Finished Steel, Raw Materials, Bolts and Rivets ▲▲

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms	
	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	\$30.00
Rerolling, 4-in. and under 10-in., Youngstown	30.00
Rerolling, 4-in. and under 10-in., Cleveland	30.00
Rerolling, 4-in. and under 10-in., Chicago	\$31.00 to 32.00
Forging quality, Pittsburgh	36.00

Sheet Bars	
	Per Gross Ton
Pittsburgh	\$30.00
Youngstown	30.00
Cleveland	30.00

Slabs	
	Per Gross Ton
Pittsburgh	\$30.00
Youngstown	30.00
Cleveland	30.00

Skelp	
	Per Lb.
Grooved	1.65c.
Universal	1.65c.
Sheared	1.65c.

Wire Rods	
	Per Gross Ton
Pittsburgh	\$35.00 to \$37.00
Cleveland	35.00 to 37.00
Chicago	35.00 to 37.00

PRICES OF RAW MATERIAL

Ores	
	Per Gross Ton
Old range Bessemer, 51.50% iron	\$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore	
	Per Unit
Iron ore low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	.8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	.25c. to .27c.
Manganese ore, African or Indian, 50 to 52%	.24c. to .26c.
Manganese ore, Brazilian, 46 to 48%	.22c. to .24c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$12.00 to \$12.25
Chrome ore, 45% Cr ₂ O ₃ crude, c.i.f. Atlantic seaboard	\$20.00
Chrome ore, 48% Cr ₂ O ₃ crude, c.i.f. Atlantic seaboard	22.50

Coke	
	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$2.50
Foundry, f.o.b. Connellsville prompt	\$3.25 to 4.75
Foundry, by-products, Ch'go ovens	8.00
Foundry, by-products, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b. ovens	8.00
Foundry, by-prod., del'd St. Louis	9.00

Coal	
	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.35 to \$1.50
Mine run coking coal, f.o.b. W. Pa.	1.40 to 1.50
Gas coal, 1/4-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.65 to .75
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.15

Ferromanganese	
	Per Gross Ton
Domestic, 80%, seaboard	\$80.00 to \$85.00
Foreign, 80% Atlantic or Gulf port, duty paid	*80.00 to 85.00

Spiegeleisen	
	Per Gross Ton Furnace
Domestic, 19 to 21%	\$28.00 to \$30.00
50%	\$35.50
75%	130.00
Electric Ferrosilicon	
	Per Gross Ton Delivered
10%	\$35.00
11%	37.00
12%	39.00

Bessemer Ferrosilicon	
	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	\$25.00
10%	26.00
11%	27.00
12%	28.00

Silvery Iron	
	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	\$21.00
6%	21.50
7%	22.00
8%	22.50
9%	23.00
10%	23.50

Other Ferroalloys	
	Per lb. contained metal
Ferrotungsten, per lb. contained metal del'd, carloads	\$1.08
Ferrotungsten, less carloads	\$1.15 to 1.25
Ferromanganese, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferromanganese, 2% carbon	17.00c. to 17.50c.
Ferromanganese, 1% carbon	19.00c. to 20.00c.
Ferromanganese, 0.10% carbon	24.50c. to 26.00c.
Ferromanganese, 0.06% carbon	26.50c. to 28.00c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferrophosphorus, electric 24%, f.o.b. Aniston, Ala., per gross ton	122.50
Silico-manganese, gross ton, delivered	135.00

Fluxes and Refractories

Fluorspar	
	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$14.00 to \$14.50
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silicon, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick	
	Per 1000 f.o.b. Works
High-Heat	Intermediate
Duty Brick	Heavy Duty Brick
Pennsylvania	\$40.00 to \$43.00
Maryland	40.00 to 43.00
New Jersey	40.00 to 43.00
Ohio	40.00 to 43.00
Kentucky	40.00 to 43.00
Missouri	40.00 to 43.00
Illinois	40.00 to 43.00
Ground fire clay, per ton	6.50

Silica Brick	
	Per 1000 f.o.b. Works
Pennsylvania	\$45.00
Chicago	49.00
Birmingham	47.00
Silica clay, per ton	8.00

Magnesite Brick	
	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick	
	Per Net Ton
Standard size	\$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts	
	Per Cent Off List
Machine bolts	.73
Carriage bolts	.73
Lag bolts	.73
Plow bolts, Nos. 1, 2, 3 and 7 heads	.73
Hot-pressed nuts, blank or tapped, square	.73
Hot-pressed nuts, blank or tapped, hexagons	.73
C.p.c. and t. square or hex. nuts, blank or tapped	.73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts	
	Per Cent Off List
Semi-finished hexagon nuts	.73
Semi-finished hexagon castellated nuts, S.A.E.	.73
Stove bolts in packages, P'gh	.80, 10, 10 and 5
Stove bolts in packages, Chicago	.80, 10, 10 and 5
Stove bolts in packages, Cleveland	.80, 10, 10 and 5
Stove bolts in bulk, P'gh	.80, 10, 10, 5 and 2 1/2
Stove bolts in bulk Chicago	.80, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Cleveland	.80, 10, 10, 5 and 2 1/2
Tire bolts	.60, 10 and 10

Discounts of 73 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets	
	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	\$2.75
F.o.b. Chicago	2.85

Small Rivets	
	Per Cent Off List
F.o.b. Pittsburgh	.70, 10 and 5
F.o.b. Cleveland	.70, 10 and 5
F.o.b. Chicago	.70, 10 and 5

Cap and Set Screws	
	Per Cent Off List
Milled cap screws	.80, 10, 10 and 5
Milled standard set screws, case hardened	.80 and 5
Milled headless set screws, cut thread	.75 and 10
Upset hex. head cap screws, U.S.S.S. thread	.85 and 10
Upset hex. cap screws, S.A.E. thread	.85 and 10
Upset set screws	.80, 10 and 5
Milled studs	.70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel	
Base per Lb.	
F.o.b. Pittsburgh mill.....	1.65c.
F.o.b. Chicago.....	1.75c. to 1.80c.
Del'd Philadelphia.....	1.94c.
Del'd New York.....	1.93c.
F.o.b. Cleveland.....	1.70c.
F.o.b. Lackawanna.....	1.75c.
F.o.b. Birmingham.....	1.80c.
C.i.f. Pacific ports.....	2.25c.
F.o.b. San Francisco mills.....	2.25c.

Billet Steel Reinforcing	
F.o.b. P'gh mills, 40, 50, 60-ft.....	1.75c.
F.o.b. Birmingham, mill lengths.....	1.75c. to 1.80c.

Rail Steel	
F.o.b. mills, east of Chicago dist.....	1.50c. to 1.55c.
F.o.b. Chicago Heights mill.....	1.60c. to 1.65c.
Del'd Philadelphia.....	1.84c. to 1.89c.

Iron	
Common iron, f.o.b. Chicago.....	1.70c. to 1.75c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.09c.
Common iron, del'd New York.....	2.14c.

Tank Plates

Base per Lb.	
F.o.b. Pittsburgh mill.....	1.65c.
F.o.b. Chicago.....	1.75c. to 1.80c.
F.o.b. Birmingham.....	1.80c.
Del'd Cleveland.....	1.83 1/2 c.
Del'd Philadelphia.....	1.85 1/2 c.
F.o.b. Coatesville.....	1.75c.
F.o.b. Sparrows Point.....	1.75c.
F.o.b. Lackawanna.....	1.75c.
Del'd New York.....	1.93c.
C.i.f. Pacific ports.....	2.05c.

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh mill.....	1.65c.
F.o.b. Chicago.....	1.75c. to 1.80c.
F.o.b. Birmingham.....	1.80c.
F.o.b. Lackawanna.....	1.75c.
F.o.b. Bethlehem.....	1.75c.
Del'd Cleveland.....	1.83 1/2 c.
Del'd Philadelphia.....	1.75c.
Del'd New York.....	1.90 1/2 c.
C.i.f. Pacific ports.....	2.15c. to 2.25c.

Hot-Rolled Hoops, Bands and Strips

Base per Lb.	
6 in. and narrower, P'gh.....	1.65c.
Wider than 6 in., P'gh.....	1.55c.
6 in. and narrower, Chicago.....	1.75c. to 1.80c.
Wider than 6 in., Chicago.....	1.65c. to 1.70c.
Cooperage stock, P'gh.....	1.80c. to 1.90c.
Cooperage stock, Chicago.....	1.80c. to 1.90c.

Cold-Finished Steel

Base per Lb.	
Bars, f.o.b. Pittsburgh mill.....	2.10c.
Bars, f.o.b. Chicago.....	2.10c.
Bars, Cleveland.....	2.10c.
Bars, Buffalo.....	2.10c.
Shafting, ground, f.o.b. mill.....	*2.45c. to 3.40c.
Strips, P'gh.....	2.25c.
Strips, Cleveland.....	2.25c.
Strips, deliv'd Chicago.....	2.53c.
Strips, Worcester.....	2.40c. to 2.50c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland.....	3.40c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)	
To Manufacturing Trade	
Bright wire.....	2.20c. to 2.30c.
Spring wire.....	3.20c. to 3.30c.

To Jobbing Trade

Base per Lb.	
Smooth annealed wire.....	2.35c. to 2.45c.
Smooth galvanized wire.....	2.80c. to 2.90c.
Polished staples.....	2.35c. to 2.45c.
Galvanized staples.....	2.60c. to 2.70c.
Barbed wire, galvanized.....	2.55c. to 2.65c.
Woven wire fence, per net ton.....	\$60.00

Base per Keg	
Standard wire nails.....	\$1.90 to \$2.00
Smooth coated nails.....	1.90 to 2.00
Galvanized nails.....	3.90 to 4.00

To Retail Trade

Base per Lb.	
Bright wire.....	2.30c. to 2.40c.
Smooth annealed wire.....	2.40c. to 2.50c.
Smooth galvanized wire.....	2.90c. to 3.00c.

Base per Keg	
Standard wire nails.....	\$2.00 to \$2.10
Cement coated nails.....	2.00 to 2.10
Galvanized nails.....	4.00 to 4.10

Base per Lb.	
Polished staples.....	2.45c. to 2.55c.
Galvanized staples.....	2.70c. to 2.80c.
Barbed wire, galvanized.....	2.65c. to 2.75c.
Woven wire fence, per net ton.....	\$65.00

Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

Light Plates Base per Lb.

No. 10, blue annealed, f.o.b. P'gh.....	1.85c. to 1.90c.
No. 10, blue annealed, f.o.b. Chicago dist.....	1.95c. to 2.00c.
No. 10, blue an'd, del'd Phila.....	2.14c. to 2.19c.
No. 10, blue annealed, B'ham.....	2.05c.
No. 10, blue annealed, Pacific Coast ports.....	2.50c.

Sheets

Blue Annealed Base per Lb.	
No. 13, f.o.b. P'gh.....	2.00c. to 2.05c.
No. 13, f.o.b. Chicago dist.....	2.10c. to 2.15c.
No. 13, del'd Philadelphia.....	2.29c. to 2.34c.
No. 13, blue annealed, B'ham.....	2.20c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.25c.
No. 24, f.o.b. Chicago dist. mill.....	2.35c.
No. 24, del'd Philadelphia.....	2.54c.
No. 24, f.o.b. Birmingham.....	2.40c. to 2.50c.
No. 24, c.i.f. Pacific Coast ports.....	3.00c.

Steel Furniture Sheets

No. 24, f.o.b. P'gh.....	3.50c.
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Galvanized

No. 24, f.o.b. Pittsburgh.....	2.80c. to 2.90c.
No. 24, f.o.b. Chicago dist. mill.....	2.90c. to 3.00c.
No. 24, del'd Cleveland.....	3.08 1/2 c.
No. 24, del'd Philadelphia.....	3.24c.
No. 24, f.o.b. Birmingham.....	3.00c.
No. 24, c.i.f. Pacific Coast ports.....	3.50c.

Continuous Mill Sheets

No. 10 gage.....	1.70c. to 1.75c.
No. 13 gage.....	1.85c. to 1.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.55c. to 2.65c.
No. 28, f.o.b. Chicago dist. mill.....	2.65c. to 2.75c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	3.10c. to 3.20c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill:	
Unassorted.....	3.25c.
Seconds.....	3.35c.
Primes only.....	3.45c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh.....	3.70c.
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Tin Plate

Base per Box	
Standard cokes, f.o.b. P'gh district mills.....	\$5.00
Standard cokes, f.o.b. Gary.....	5.10

Terne Plate

(F.o.b. Morgantown or Pittsburgh)	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C. \$10.30	125-lb. coating I.C. \$15.20
15-lb. coating I.C. 12.90	30-lb. coating I.C. 16.00
20-lb. coating I.C. 14.00	40-lb. coating I.C. 17.80

Alloy Steel Bars

(F.o.b. maker's mill)	
Alloy Quantity Bar Base, 2.65c. per Lb.	

S.A.E. Series	
Numbers	
2000 (1 1/2% Nickel).....	\$0.25
2100 (1 1/4% Nickel).....	0.55
2300 (3 1/4% Nickel).....	1.50
2500 (5% Nickel).....	2.25
3100 Nickel Chromium.....	0.55
3200 Nickel Chromium.....	1.35
3300 Nickel Chromium.....	3.80
3400 Nickel Chromium.....	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45
5100 Chromium Spring Steel.....	0.20
6100 Chromium Vanadium Bar.....	1.20
6100 Chromium Vanadium Spring Steel.....	0.95
9250 Silicon Manganese Spring Steel (flats).....	0.25
Rounds and squares.....	0.50
Chromium Nickel Vanadium.....	1.50
Carbon Vanadium.....	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 1/4c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Rails

Per Gross Ton	
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	34.00
Light (from rail steel), f.o.b. mill.....	32.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

Track Equipment

Base per 100 Lb.	
Spikes, 3/4 in. and larger.....	\$2.70
Spikes, 1/2 in. and larger.....	2.70

Spikes, boat and barge.....	\$2.90
Tie plate, steel.....	1.95
Angle bars.....	2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	.73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld	
Steel	
Inches	Black Galv.
1/4.....	47 21 1/2
1/4 to 3/4.....	53 27 1/2
1/2.....	58 44 1/2
3/4.....	62 50 1/2
1 to 3.....	62 52 1/2

Lap Weld	
Iron	
Inches	Black Galv.
1/4 and 3/4.....	+11 +36
1/2.....	23 5
3/4.....	28 11
1 and 1 1/4.....	31 15
1 1/2 and 2.....	35 18

Butt Weld, extra strong, plain ends	
Steel	
Inches	Black Galv.
1/4.....	43 26 1/2
1/4 to 3/4.....	49 32 1/2
1/2.....	55 44 1/2
3/4.....	60 49 1/2
1 to 1 1/4.....	62 51 1/2
2 to 3.....	63 52 1/2

Lap Weld, extra strong, plain ends	
Steel	
Inches	Black Galv.
2.....	55 44 1/2
2 1/2 to 4.....	59 48 1/2
4 1/2 to 6.....	58 47 1/2
7 to 8.....	54 41 1/2
9 and 10.....	47 34 1/2
11 and 12.....	46 33 1/2

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discount of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh	
Steel	
Inches	Charcoal Iron
2 in. and 2 1/2 in.....	38 1 1/2 in.....
2 1/2 in.—2 3/4 in.....	46 1 3/4 in.....
3 in.....	52 2 in.—2 1/4 in.....
3 1/4 in.—3 1/2 in.....	54 2 1/2 in.—2 3/4 in.....
4 in.....	57 3 in.....
4 1/2 in. to 6 in.....	46 3 1/2 in. to 3 3/4 in.....
	4 in.....
	4 1/2 in.....

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts: Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
Inches	Hot Rolled
1 in.....	61 3 in.....
1 1/4 to 1 1/2 in.....	53 3 1/4 to 3 1/2 in.....
1 1/2 in.....	37 4 in.....
2 to 2 1/4 in.....	32 4 1/2, 5 and 6 in.....
2 1/4 to 2 3/4 in.....	40
2 and 2 1/4 in.....	38 3 1/4 to 3 1/2 in.....
2 1/2 and 2 3/4 in.....	46 4 in.....
3 in.....	52 4 1/2, 5 and 6 in.....

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List	
Carbon, 0.10% to 0.30% base (carloads).....	55
Carbon, 0.30% to 0.40% base.....	50
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

Reinforcing Steel

Awards Light—Inquiries in Larger Volume

REINFORCING steel awards the past week, at 3850 tons, were the smallest for any week since Feb. 26 and compare with 12,600 tons a week ago. The largest letting was for an ore dock at Marquette, Mich., which will take 1400 tons. Inquiries were in larger volume and call for 7100 tons, compared with 2400 tons in the previous week. Government locks at Harvey, La., will require 3500 tons. Other pending business is mostly in small tonnages. Awards follow:

BOSTON, 700 tons, Kenmore station subway extension, to Truscon Steel Co.

NEW YORK, 300 tons, sewer at 108th Street, Borough of Queens, to Concrete Steel Co.

ARDMORE, PA., 130 tons, building for Ardmore Times, to unnamed distributor.

MARQUETTE, MICH., 1400 tons, ore dock for Duluth, South Shore & Ashland Railroad, to Worden-Allen Co.

EVANSTON, ILL., 100 tons, school, to Olney J. Dean & Co.

NEW ORLEANS, 100 tons, United States Veterans' Hospital addition, to Laclede Steel Co.

GRAND ISLAND, NEB., 100 tons, filtration plant, to Laclede Steel Co.

LOS ANGELES, 100 tons, apartment building at 915 South Wilton Street, to unnamed bidder.

SAN DIEGO, CAL., 100 tons, extension to naval barracks, to unnamed bidder.

PASADENA, CAL., 300 tons, medical building, to unnamed company.

SACRAMENTO, 416 tons, paving in Monterey County, to unnamed company.

SACRAMENTO, 107 tons, paving in Mendocino County, to Truscon Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

WESTFIELD, MASS., 125 tons, State bridge.

NEW YORK, 2000 tons, foundations for freight terminal and warehouses for New York Central Railroad; low bidder for general contract reported to be P. T. Cox Contracting Co.

NEW YORK CENTRAL RAILROAD, 500 tons, cold storage warehouse; bids open April 14.

PHILADELPHIA, 300 tons, sewer; bids open April 8.

BURLINGTON, N. J., 140 tons, sewage disposal plant; bids in.

WASHINGTON, 160 tons, warehouse for Thomas Somerville Co.; bids received.

WASHINGTON, 150 tons, National Capital Press building; C. H. Tompkins Co., general contractor.

CLEVELAND, 400 tons, bridges for Cleveland Union Terminals Co.

CLEVELAND, 150 tons, Cedar Point County road culvert.

CHICAGO, 800 tons, approaches to outer bridge.

HARVEY, LA., 3500 tons, locks for United States Government.

LOS ANGELES, 100 tons, apartment building at 1407 North Catalina Avenue; bids being taken.

LOS ANGELES, 250 tons, apartment building, Cherokee and Selma Streets; bids being taken.

SACRAMENTO, 305 tons, bridge in San Diego County; bids April 22.

SAN FRANCISCO, 200 tons, ward building, Presidio; bids being taken.

Water Route Soon Open from Peoria to Gulf

Peoria, Ill., will have completed by May 1 its new waterway terminal, and navigation between Peoria and New Orleans will be inaugurated within the next four or five weeks. This terminal is equipped with a 25-ton crane and has full facilities for handling 2000 tons of merchandise daily. It has been constructed on an expansion plan providing ample room to more than treble the tonnage within a short time. There has already moved from this terminal about 3000 tons of cement consigned to St. Louis, and similar shipments are being planned to Louisiana, where extensive road building programs are being undertaken.

Peoria has already entered into agreements with the 12 railroads entering the city, giving them access to the terminal.

J. D. Cunningham Heads Chicago Metal Trades

J. D. Cunningham, president, Republic Flow Meters Co., Chicago, was elected president of the Chicago branch of the National Metal Trades Association at its thirty-third annual meeting and dinner held March 26 at the Palmer House, Chicago. Other officers elected were: Vice-President, A. E. Blackwood, president, Sullivan Machinery Co., and treasurer, C. A. Ziebarth, secretary, Bell & Howell Co. Newly elected members of the executive committee are Charles E. Finkl, general manager, A. Finkl & Sons Co.; William Ganschow, vice-president, Gears & Forgings, Inc.; Warren G. Jones, president, W. A. Jones Foundry & Machine Co.; M. W. McArdle, president, Chicago Flexible Shaft Co., C. H. Strawbridge, president, Goodman Mfg. Co., and E. A. Thatcher, president, United Screw & Bolt Corp.

Nomenclature of Rustless Steels Changed

The Allegheny Steel Co., Brackenridge, Pa., has taken a step to end the confusion prevalent in the alloy field as a result of the large number of trade names used. Effective immediately, this company will use the name Allegheny in connection with all its products. The whole group of chromium and chromium-nickel alloys made by the company will be known as "Allegheny Alloys." The name of Allegheny Metal, the 18 and 8 alloy, will remain unchanged, but the alloys hitherto bearing the name of Ascoloy will hereafter be known as Allegheny 33, 44, etc., using the same differentiating numerals that are now used with the word Ascoloy.

The action of the Allegheny company came following a survey which developed the fact that there were 104 different trade names in the alloy field in this country. Opinions obtained from engineers and buyers indicated that this condition complicated purchasing and made it difficult for buyers of these materials to keep the different types of alloys in mind and to identify each with its manufacturer.

Under the new nomenclature, the

better known members of the Allegheny alloys family will be known by the names Allegheny Metal (17-20 per cent chromium, 7 to 10 per cent nickel); Allegheny 33 (12 to 16 per cent chromium); Allegheny 44 (22 to 25 per cent chromium, 10 to 13 per cent nickel); Allegheny 55 (chromium 26 to 30 per cent); Allegheny 66 (15 to 18 per cent chromium).

Employment Off Slightly in Cleveland in March

Employment in the metal-working industry in Cleveland fell off slightly in March as compared with February, as is shown by the monthly report of the Cleveland Chamber of Commerce based on a survey of 42 companies covering diversified industries including machine tool plants and foundries. However, there was a little increase in the hours of employment. The employees of 42 firms in March numbered 16,194, compared with 16,649 in February and 16,025 in January. The average hours per week were 42.8 in March against 42.5 in February. The recent low point was in November, when the average weekly hours per employee were 40.3.

Corrigan-McKinney Cuts Wages 10%

The Corrigan-McKinney Steel Co., Cleveland, has announced a 10 per cent reduction in wages, labor being reduced from 55c. to 50c. per hr. A similar cut has been made in the pay of salaried employees.

Railroad Equipment

Delaware, Lackawanna & Western has ordered 35 air dump cars, 25 from Magor Car Corp. and 10 from Koppel Industrial Car & Equipment Co.

Victoria-Itabira, Rio Janeiro, Brazil, has ordered one 4-6-2 type locomotive from Baldwin Locomotive Works.

Bush Terminal Co. has ordered seven 55-ton oil-electric locomotives from Ingersoll-Rand Co.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Copper Inactive—Tin Dull—Lead and Zinc Steady and Quiet

NEW YORK, April 7.

COPPER

Easter holidays abroad, including Good Friday and Easter Monday, have caused a very quiet market in all the metals on this side. Demand for copper, both from domestic and foreign users, has been very light this month. Sales for shipment abroad have not been over 2000 gross tons, and domestic buying has not been much more than this total. There has been very little change in prices. The primary producers still adhere to 10c. for electrolytic copper, delivered in the Connecticut Valley, and one or two custom smelters are doing some business at 9.75c. There was a sale of a small tonnage the other day at 9.50c., delivered in the Connecticut Valley, but it is believed that the amount available at this price is decidedly limited. In fact, one or two custom smelters are not eager to sell at 9.75c., delivered. The quotation of Copper Exporters, Inc., is unchanged at 10.30c., c.i.f. usual European ports. Most of the domestic business is being taken by custom smelters at 9.75c. Lake copper is quiet and unchanged, at 10c. to 10.12½c., delivered.

TIN

This market is more affected by the Easter holidays in London than any of the others. Only a small business is reported done, mostly by consumers, in the past week, and prices have been close to 26.50c. for spot Straits tin, New York. The quotation today is 25.85c., New York, for spot Straits, with a fair business reported. In the London market quotations were about £2 a ton less than a week ago, with spot standard quoted at £117 5s., future standard at £118 12s. 6d., and spot Straits at £119 15s. The Singapore price today is £121 15s. Stocks of metal in the United Kingdom for the week ended Saturday, April 4, were 26,994 tons, an increase of 160 tons. March shipments from the East were 6174 tons, which compares with an estimate for the month of 8500 tons. Shipments from the Straits for April are estimated at about 8500 tons, with production at 9700 tons.

LEAD

In a very quiet market, current demand is confined to carload and small lots for early shipment. It is esti-

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY						
	Apr. 7	Apr. 6	Apr. 4	Apr. 3	Apr. 2	Apr. 1
Lake copper, New York.....	10.12½	10.12½	10.12½	10.12½	10.12½	10.12½
Electrolytic copper, N. Y.*.....	9.50	9.50	9.50	9.50	9.50	9.50
Straits, tin, spot, N. Y.	25.85	26.50	.....	26.50	26.45	26.60
Zinc, East St. Louis.....	3.95	3.95	3.95	3.95	3.95	3.95
Zinc, New York.....	4.30	4.30	4.30	4.30	4.30	4.30
Lead, St. Louis.....	4.25	4.25	4.25	4.25	4.25	4.25
Lead, New York.....	4.50	4.50	4.50	4.50	4.50	4.50

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

mated that consumers' needs for April have been only about 75 per cent negotiated. Buying for May has hardly appeared. Prices are firm and unchanged at 4.25c., St. Louis, and 4.50c., New York, the latter being the contract price of the leading interest.

ZINC

Sales of prime Western for the week have been only about 1700 tons, and there is no life to the market. Prices remain unchanged at the low point of 3.95c., East St. Louis, or 4.30c., New York, for prime Western. Ore prices continue at \$24 to \$25 a ton, Joplin, with sales for the week ended April 4 at 4790 tons. With both production and shipments somewhat higher, there has been a small reduction in the ore surplus, which is now estimated at about 58,800 tons.

ANTIMONY

In a dull market, Chinese metal is

quoted at 7c., New York, duty paid for spot delivery, with futures at 6.90c.

NICKEL

Electrolytic cathodes are quoted at 35c. a lb., with shot and ingot made from remelted electrolytic at 36c. a lb. for single lots of spot metal.

ALUMINUM

Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 22.90c. a lb., delivered.

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Members of the Municipal Engineers Association of the City of New York were guests of the Bethlehem Steel Co., on April 8 at its plant at Bethlehem, Pa. The object of their trip was to inspect materials used in city work.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.	
High brass	17.25c.
*Copper, hot rolled, base sizes.....	19.87½c.
Seamless Tubes—	
Brass	20.12½c.
Copper	22.37½c.
Brass Rods	15.50c.
Brass Tubes	25.12½c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.	
Zinc sheets (No. 9),	
casks	9.75c. to 10.25c.
Zinc sheets, open.....	10.75c. to 11.25c.

Metals from New York Warehouse

Delivered Prices, per Lb.	
Tin, Straits pig.....	28.00c. to 29.00c.
Tin, bar	30.00c. to 31.00c.
Copper, Lake.....	11.25c. to 11.75c.
Copper, electrolytic.....	11.00c. to 11.50c.
Copper, casting.....	10.75c. to 11.25c.
Zinc, slab	5.50c. to 6.50c.
Lead, American pig.....	5.50c. to 6.50c.
Lead, bar	7.50c. to 8.50c.
Antimony, Asiatic	10.00c. to 10.50c.
Aluminum No. 1 ingots	
for remelting (guaranteed over 99% pure).....	24.00c. to 25.00c.
Alum. ingots, No. 12	
alloy	23.00c. to 24.00c.
Babbitt metal, commercial	
grade	25.00c. to 35.00c.
Solder, ½ and ½.....	19.00c. to 20.00c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.	
Tin, Straits pig.....	31.25c.
Tin, bar	33.25c.
Copper, Lake	11.13c.
Copper, electrolytic	11.13c.
Copper, casting	10.63c.
Zinc, slab	5.50c.
Lead, American pig.....	5.25c. to 5.40c.
Lead, bar	8.00c.
Antimony, Asiatic	10.50c.
Babbitt metal, medium grade.....	15.75c.
Babbitt metal, high grade.....	35.25c.
Solder, ½ and ½.....	20.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c.	8.75c.
Copper, hvy. and wire	7.50c.	8.50c.
Copper, light and bottoms	6.50c.	7.25c.
Brass, heavy.....	4.50c.	5.25c.
Brass, light.....	3.75c.	4.75c.
Hvy. machine composition	6.75c.	7.50c.
No. 1 yel. brass turnings	5.00c.	5.50c.
No. 1 red brass or compos. turnings.....	6.50c.	7.25c.
Lead, heavy	3.25c.	3.75c.
Lead, tea	2.00c.	2.50c.
Zinc	2.00c.	2.50c.
Sheet aluminum.....	10.00c.	10.00c.
Cast aluminum	5.00c.	7.50c.

Junking of Old Automobiles Increased in Past Year

Highway Safety Program of Manufacturers Credited with Reducing Worn-Out Cars

OFFICIAL 1930 motor vehicle registration figures just released by the Government point to a new record in the junking of old cars, Alfred Reeves, general manager of the National Automobile Chamber of Commerce, says in his report to directors of the organization.

"The figures show that last year 2,925,000 motor vehicles were junked as a result of the normal wearing out of cars and of the special junking plan of the manufacturers with their dealers, under which 350,000 additional vehicles of unsafe character have been eliminated from the highways," Mr. Reeves declared.

Manufacturers representing more than 87 per cent of the industry's production are now cooperating with their dealers in a program by which the dealer is partially compensated for a certain number of unsafe cars which he may junk rather than undertake to resell after a trade-in.

Registration 23,042,840 on Dec. 31

The total registration of cars on Dec. 31 was 23,042,840, against 23,121,589 for 1929—a decrease in cars registered of 78,749 units. Trucks registered were 3,480,939—an increase of 101,085 units over the previous year.

The total vehicle registration at the end of 1930 was 26,523,779 cars and trucks—an increase of only 22,336 units over the previous year. Comparison of these registration figures with the estimated domestic consumption of 1930 motor vehicle output, it is stated, indicates an unprecedented junking activity for the year.

Removal of 350,000 antiquated automobiles from service is credited to the highway safety program recommended to individual motor manufacturers by directors of the National Automobile Chamber of Commerce about a year ago.

Under the plan, as announced by Mr. Reeves, the manufacturers established a reserve fund based generally on \$5 to \$10 for each new car which the dealer buys, and to the amount of that fund their dealers are permitted to scrap old cars. The amount allowed on such junked cars ranges from \$25 to \$35.

Besides this, dealers scrap many more cars for which they receive no compensation because the junking fund is exhausted. The plan simply provides some compensation to the

dealer for losses which might be incurred in the scrapping of a limited number of the used cars that he takes in.

Call Antiquated Cars a Menace

The highway safety program resulted from a general recognition by the industry that the continued operation of antiquated vehicles constituted not only an unnecessary annoyance but a serious menace to the safety of other highway users.

This problem was complicated by the fact that automobile dealers, under the pressure of competition, were making more liberal allowances on worn-out trade-ins than were justified, and then were tempted to resell the vehicles although they had outlived their usefulness.

While most manufacturers allow their dealer a certain stipulated allowance for a limited number of cars that are demolished in the presence of a factory representative, or through an authorized junk yard, one company pays a flat rate of \$20 for each complete car that is delivered to the company's private salvage plant.

It is anticipated that 1931 will witness an even greater number of vehicles removed from the highways as other companies join in the program.

In his report, Mr. Reeves disclosed that the Institute of Scrap Iron and Steel has undertaken to develop a plan for cooperating with the automobile manufacturers and cooperating in the program, providing for official junk yards.

Canada Increases Duties on Tin Plate

WASHINGTON, April 7.—Through reclassification, Canada has increased from 5 to 15 per cent the general duty on tin plate, which will apply to the United States and other non-treaty countries. The intermediate duty, applicable to countries having commercial treaties with Canada, has been increased from 5 to 12½ per cent, while the British preferential has been removed from the duty free class and given a duty of 7½ per cent.

The change was announced in a Canadian appraisers' bulletin of April 1, which declares that tin plate and tinned sheets of the class affected are of a class now made in Canada

and therefore dutiable at the new rates, says a report from Commercial Attache Lynn W. Meekins. The changes are made under tariff item 383 (b). The specific gages and weights covered are described in the bulletin as follows:

Coke and charcoal tin plates and tinned sheets of iron or steel, up to 54 in. wide by 72 in. long or longer, in weights from 55 base or 38 gage to 275 base or 22 gage, inclusive, in the following qualities: Coke, best coke, best best coke, canners' special, silver tin, and stove board, and in A and AA charcoal.

E. Arthur Tutein Wins Appeal in Suit

E. Arthur Tutein, Inc., Boston, has won a verdict in the Court of Appeals of New York in the case against the Hudson Valley Coke & Products Corp., Troy, N. Y., in which a board of arbitration awarded \$335,000 to the Tutein company in settlement of an alleged breach of contract. E. Arthur Tutein, Inc., was selling agent for pig iron and coke for the Hudson Valley company.

New Pension Rules for Corporation Employees

New pension rules, subject to acceptance by stockholders, will become effective in United States Steel Corp. plants on May 1. Under the revised provisions every male employee who has been in service for 25 years or longer will be retired at the age of 70, or may be retired at his own request or at the request of his superior at the age of 65. Women with 25 years of service will be retired at 60 or may retire at their own request or that of their employing officers at 55.

For each year of his or her service the pensioner will receive one per cent of the average monthly pay received during the last 10 years of employment. Thus, if an employee had received an average of \$100 a month in the final decade of service and had been in the employ of a Corporation subsidiary for 30 years, the pension would be \$30 a month.

Pensions are paid from the United States Steel and Carnegie Pension Fund, which was established in 1910 and began operations on Jan. 1, 1911.

Trade Research Bureau of Corporation Discontinued

The Trade Research Bureau of the United States Steel Corp., Frick Building, Pittsburgh, has been discontinued. The trade research activities of individual subsidiaries will be continued, with the offices of the Steel Corporation at New York acting as a clearing house.

FABRICATED STRUCTURAL STEEL

Two Chicago Projects Swell New Work to 128,000 Tons—41,500 Tons of Awards Include St. Louis Bridge

NEW projects requiring fabricated structural steel make another large total this week, at 128,000 tons. Most of the new tonnage is in two Chicago projects, about 75,000 tons for extensions and alterations to elevated structures and 25,000 tons for viaducts, elevated streets and approaches.

In the 15 issues of this year, THE IRON AGE has reported a total of 943,500 tons of new structural steel projects, compared with only 423,000 tons in 15 corresponding issues of last year, and 558,000 tons in the same period of 1929.

Awards of the week, totaling about 41,500 tons, include 13,000 tons for Government aircraft hangars at various points, 7000 tons in the East St. Louis approach to a municipal bridge, 5200 tons of plates and shapes for steel scows for the American Dredging Co., Philadelphia, and 1500 tons for a State hospital at Wingdale, N. Y. Awards follow:

North Atlantic States

STATE OF NEW YORK, 200 tons, highway bridges, to American Bridge Co.
NEW YORK, 400 tons, bridge on Sunrise Highway, Rockaway Boulevard, to McClintic-Marshall Corpn.
NEW YORK, 1030 tons, addition to American Museum of Natural History, to Harris Structural Steel Co.
WINGDALE, N. Y., 1580 tons for State Hospital, to McClintic-Marshall Corpn.
ROCHESTER, N. Y., 715 tons, Divinity School for Colgate University, to Leach Structural Steel Co.
STATE OF NEW YORK, 280 tons, highway bridges, to McClintic-Marshall Corpn.
STATE OF NEW JERSEY, 500 tons, highway bridges in Bergen County, to Harris Structural Steel Co.
PHILADELPHIA, 5200 tons, plates and shapes for steel scows for American Dredging Co., to Dravo Contracting Co.
PHILADELPHIA, 2500 tons; Market Street subway 2000 tons, temporary decking beams 500 tons, to Keystone State Corpn.
PENNSYLVANIA RAILROAD, 1081 tons; bridge at Lock Haven, Pa., 842 tons, to Phoenix Bridge Co., and bridge at Canton, Ohio, 239 tons, to American Bridge Co.
WASHINGTON, 13,000 tons, aircraft hangars at various points for Government, to Belmont Iron Works.
MONROE COUNTY, N. Y., 100 tons, State highway bridge, to Kellogg Structural Steel Co.
PITTSBURGH, 315 tons, steel tank barge for Atlantic Refining Co., to Dravo Contracting Co.

The South

WHEELING, W. VA., 175 tons, two barges for Independent Sand Co., to Dravo Contracting Co.
GALVESTON, TEX., 1000 tons, Union station, to Mosher Steel & Machinery Co.
GALVESTON, 1000 tons, State office building, to Houston Structural Steel Co.

Central States

MAYSVILLE, MICH., 100 tons, bridge, to American Bridge Co.

WALBRIDGE, OHIO, 850 tons, bridge for Chesapeake & Ohio Railroad, to McClintic-Marshall Corpn.
STATE OF IOWA, 540 tons, highway bridges, to Clinton Bridge Co.
CHICAGO, 200 tons, additional steel for Fine Arts Building, to McClintic-Marshall Corpn.
CHICAGO, 100 tons, rings for water tunnel, to Midland Structural Steel Co.
ST. LOUIS, 7000 tons, East St. Louis approach to St. Louis municipal bridge, to Mississippi Valley Structural Steel Co.

Western States

NORTH PLATTE, NEB., 100 tons, power station, to Paxton Vierling Iron Works.
UNION PACIFIC, 300 tons, miscellaneous bridge work, to Paxton Vierling Iron Works.
KENILWORTH, UTAH, 750 tons, plates and shapes for coal tippie for Independent Coal & Coke Co., to Pittsburg Boiler & Machine Co., Pittsburg, Kan.
OKLAHOMA CITY, 500 tons, Rock Island viaduct, to Capital Iron Works Co., Topeka, Kan.
SAN FRANCISCO, 120 tons, apartment building at Pacific and Gough Streets, to McClintic-Marshall Corpn.
SAN FRANCISCO, 250 tons, science building at Golden Gate Park, to Dyer Brothers.
PEARL HARBOR, HONOLULU, 815 tons, sea-plane hangar, to McClintic-Marshall Corpn.

Canada

TORONTO, 700 tons, botany building for University of Toronto, to Dominion Bridge Co.
ST. CATHARINES, ONT., 200 tons, addition to Ridley College, to Sarnia Bridge Co.
HALIFAX, N. S., 200 tons, two bridges for Department of Highways, Provincial Government, to Robb Engineering Works.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

STATE OF MASSACHUSETTS, 500 tons, bridges.
EVERETT, MASS., 160 tons, chemical plant unit.
STATE OF NEW YORK, 1000 tons, highway bridges.
NEW YORK, 3000 tons, administration building for Board of Health.
NEW YORK, 6300 tons, warehouse at Sixty-fourth and Sixty-fifth Streets; previously reported awarded to Hay Foundry & Iron Works.
NEW YORK, 1500 tons, superstructure for New York Central Railroad cold storage warehouse.
STATEN ISLAND, N. Y., 350 tons, bridge for Baltimore & Ohio Railroad.
STATE OF NEW JERSEY, 15,000 tons, express highway bridge over Hackensack River; Phoenix Bridge Co., low bidder.

The South

CAIRO, W. VA., 450 tons, theater.
HARVEY, LA., 1500 tons, piling for locks for United States Government.

Central States

ANN ARBOR, MICH., 1000 tons, building for University of Michigan; bids being

taken by James Baird, general contractor.

CLAY CITY, OHIO, 400 tons, building for Kansas City Lime & Transport Co.
MARQUETTE, MICH., 650 tons, ore dock for Soo Line.
CHICAGO, 75,000 tons, extensions and alterations to elevated structures over two-year program.
CHICAGO, 25,000 tons, South Park Commissioners, for viaducts, elevated streets and approaches at river and outer bridge.
CHICAGO, 45,000 tons, Post Office, first contracts to be made near end of April.
PEORIA, ILL., 155 tons, Central-National Bank addition.
WINNETKA, ILL., 1000 tons, New Trier High School addition.
STATE OF ILLINOIS, 1400 tons, highway bridges; bids taken April 14.

Western States

DENVER, 700 tons, RKO theater.
PORTLAND, ORE., 400 tons, plates, four steel scows for United States Engineer Office; bids being taken.
SAN DIEGO, CAL., 300 tons, plates, floating derrick, Mare Island, Cal.; bids being taken.
SACRAMENTO, 525 tons and 120 tons of sheet steel piling, bridge over Santa Fe tracks near Essex; bids opened.

Canada

TORONTO, 6000 tons, 26-story building for Bank of Nova Scotia.
COBOURG, ONT., 500 tons, hotel for Harry Alexander, care of Arlington Hotel.

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Declines in Scrap at Detroit

DETROIT, April 7.—With operations of consumers falling off and an increasing amount of scrap coming out of the automobile industry, prices of leading items have declined 25c. to 50c. a ton. Dealers feel that a further drop is likely to occur in the immediate future because of the dearth of interest on the part of large buyers, including the local steel plant.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov.	
steel	\$8.75 to \$9.25
Borings and short turnings	4.25 to 4.75
Long turnings	3.75 to 4.25
No. 1 machinery cast.....	9.25 to 9.75
Automotive cast.....	11.25 to 11.75
Hydraul. comp. sheets.....	8.50 to 9.00
Stove plate	6.50 to 6.75
New No. 1 busheling.....	7.25 to 7.75
Old No. 2 busheling.....	3.25 to 3.75
Sheet clippings	5.75 to 6.00
Flashings	7.50 to 8.00

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The Lukens Steel Co., Coatesville, Pa., which recently disposed of its New Orleans warehouse and fabricating plant to the Jones & Laughlin Steel Corpn., has opened a New Orleans office in the Pan-American building, 610 Poydras Street. The new office will be in charge of Adolph Rider, a native of New Orleans, who was sales manager there until recently, when he was transferred to the company's Atlanta, Ga., branch, which is to be closed. The Lukens Steel Co. shipped its first boiler plate to New Orleans in 1835.

Low Export Prices on Certain Products Cause German Withdrawal from Market

(By Cable)

LONDON, ENGLAND, April 7.

CONTINENTAL markets are quiet and steel prices maintained, but the German Steel Union has withdrawn from export trade in certain rolled steel products until prices materially improve.

Certain French mills believe a revival of business imminent as consumers' and merchants' stocks of steel are reported to be practically exhausted and freight rates and prices are at an exceedingly low level.

Polish rail mills, recently reported as about to enter into membership in the International Rail Makers' Association, have now refused to join.

The Soviet Union has specified shipment of 25,000 tons of shapes on a contract placed some time ago with German mills.

It is reported that the Société Anonyme des Hauts-Fourneaux et Acieries de Steinfort at Steinfort, Luxemburg, which is controlled by "Angleurathus," a combination of the Société Anonyme des Acieries d'Angleur at Tilleur and the Société Anonyme d'Athus-Grivegnée at Athus, Belgium, is negotiating a merger with "Arbed," the Acieries Reunies de Burbach-Eich-Dudelange in Luxemburg.

British steel markets have been quiet over the holiday period, and certain mills are prolonging the holiday suspension.

The outlook for shipbuilding is depressing, as, even with a sudden rush of contracts to Clyde shipyards, the year's output will be about the smallest on record. Launchings in March from Clyde yards were 10 vessels of 6000 tons. There are now seven empty shipyards and no fresh orders were booked in March.

Prior to the Easter holiday there was a slight revival in demand for thin gage black sheets from Japan, and some business was transacted at about £10 10s. (\$51.03) per ton, c.i.f. Japanese port.

German tin plate exports to Japan grow with 35,000 boxes arriving in April.

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Ferromanganese competition in export markets forces British to quote under £9 (\$43.74), c.i.f. Belgian ports.

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Soviet specifies 25,000 tons of shapes on contract with German mills.

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High tariff walls foreseen in Europe by American representative to International Chamber of Commerce.

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Competition for ferromanganese business in foreign markets has been keen, and British makers have found it necessary to offer ferromanganese at under £9 (\$43.74) per ton, c.i.f. Belgian ports.

Italian production in January and February totaled 77,000 tons of pig iron and 232,000 tons of raw steel. The January rolled steel output was 94,000 tons.

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British Railroads Use More Steel Ties

LONDON, ENGLAND, March 28.—The Southern Railway, one of the four great British systems, has just placed orders for 36,000 tons of steel rails and 5500 tons of steel railroad ties. The order for steel ties is the duplicate of an experimental order placed about two years ago. About 62,000 steel ties are to be used this year on the lines of the Great Western Railway, in sections of one-half

to one mile on various parts of the system, in which there are at present more than 136,000 steel ties in service. During the past two years, steel ties have been laid by the Great Western on its main line and branches.

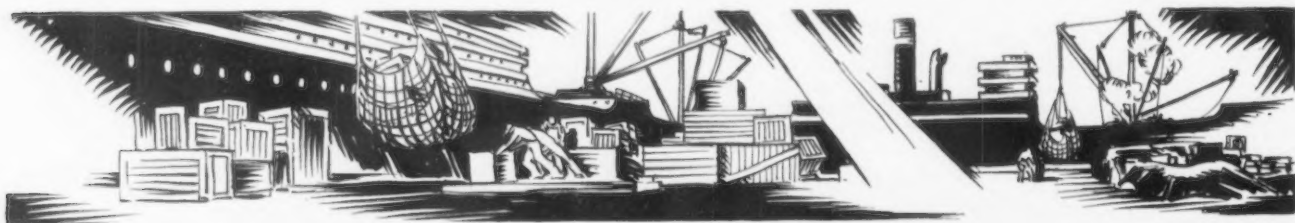
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German Tin Plate Invades Japanese Market

Germany is becoming an increasingly important source of tin plate supply for foreign markets, and, with Japanese capacity for tin plate output being expanded, the export business enjoyed in the past by American and Welsh tin plate makers appears to be dwindling. While the German product apparently does not compare in Japanese estimation with the best American and Welsh tin plate, it is said to be of good quality, and the price is lower, in certain instances being as much as \$1 a base box under the quotation of other foreign sellers. Recently tin plate has been sold at about \$4.45 a base box, c.i.f. Japanese port, with German mills quoting about \$3.50 a base box, c.i.f. port.

The Nippon Oil Co. of Japan closed the past week on 13,300 boxes of oil can sizes of tin plate, of which 9300 boxes went to five American makers through two Japanese trading companies, and 4000 boxes were awarded to German mills through two other trading companies. A sugar refining company in Formosa has closed on 2500 base boxes of German tin plate, and the Meiji Sugar Refining Co. in Japan is in the market for 500 base boxes of 170-lb. tin plate, specifying the American product. It is estimated that deliveries of foreign material to Japanese ports in April will include 35,000 base boxes of German tin plate for independent oil companies of Japan, including the Kyoto Oil Co.

Meanwhile, the Government works at Yawata, Japan, has placed 300 tons



of additional tin plate making capacity in operation, effective April 1, bringing its total monthly output to 2500 tons, or 50,000 boxes (about 600,000 boxes annually). Of the Government works total annual output, about 3600 tons, or 72,000 base boxes, usually go to the Nippon Oil Co.; about 4800 tons, or 96,000 boxes, to the Osaka Mfg. Co., and about 1800 tons, or 36,000 boxes, are used by the Government works itself for can making. The remaining 396,000 boxes are available for sale in the Japanese market.

Australia Revises Basis of Customs Valuations

WASHINGTON, April 7.—In levying customs duties in the future, Australia will establish valuations on the basis of exchange rates existing between the country of origin and the United Kingdom instead of the exchange rates with Australia, says a report to the Department of Commerce. The arrangement is understood to be temporary, as the Australian customs act may be revised later so that exchange rates between Australia and the countries of importation may be taken into consideration when dutiable values are being converted.

Japan Exporting Steel to Philippines

YOKOHAMA, JAPAN, March 11.—The Seitetsu-Jo (Government Works) has developed a substantial export trade in steel products with various Chinese ports, Siberia, Manchuria, Siam and Singapore, and recently has been cultivating Manila in the Philippine Islands as a new market. Competition with Belgian and German products is being encountered in this new field, but some fair orders have been booked.

Metal-Consuming Shops Planned in South Africa

WASHINGTON, April 7.—A recent development in the building of a steel plant at Pretoria by the South African Iron & Steel Industrial Corp., says a report to the Department of Commerce, is the statement by certain South African companies that small metal-consuming plants will be constructed in the district as soon as the new steel works is ready to furnish materials.

First shipments of construction material and equipment for the new plant are expected toward the end of this year. One of the first units will be the coke ovens, which will be followed shortly by a blast furnace. Production will be concentrated at first on rails and steel railroad ties, but the range of products will be rapidly expanded to include corrugated and flat sheets, wire and standard specification bars and shapes.

Higher European Tariffs Believed in Prospect

WASHINGTON, April 7.—A distinct trend toward high tariffs in European countries is seen by H. C. MacLean, American representative at the International Chamber of Commerce in Paris.

In England, he says, the campaign for a protective tariff has been given a new stimulus by specific proposals just put forward by the Federation of British Industries, demanding immediate imposition of an emergency tariff sufficiently high to afford effective protection to home industries, with provisions for a wide extension of preference to imports from other parts of the Empire.

France, through its commercial treaties, is under obligation to maintain more than two-thirds of its

customs duties at their present level, but is trying hard to persuade nations to which it is so bound to accept higher rates, which it considers indispensable.

The German Government, Mr. MacLean continues, has asked and expects to receive at an early date broad powers to modify customs duties either upward or downward on its own responsibility and without special permission. Both Austria and Switzerland are working on upward revisions of their present tariffs, while Persia has taken a radical step in an attempt to solve its financial difficulties by adoption of a plan whereby all imports will be conditional on a corresponding value of exports.

Germany is reported to be considering admission free of duty of a quantity of Rumanian grain if the latter country places a large order for farm machinery; France is also trying to reach an understanding with Central and Eastern European agricultural countries; and Great Britain has opened negotiations with a number of Continental nations in the hope of obtaining more favorable treatment for British products.

American Embassy, Paris, to Require Steel

WASHINGTON, April 7.—Between 4000 and 5000 tons of structural steel will be required for the American embassy to be built in Paris. The State Department has sent specifications to the Public Printer preliminary to asking for bids. Bids will be opened to producers of all countries, and material, if shipped from the United States, would be permitted free entry. The architects are Delano & Aldrich, New York. The new British embassy in Washington was built of American steel. Apparently the advantage in furnishing steel for the embassy in Paris lies with French makers.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp with the £ at \$4.8665 (par).

British Prices, f.o.b. United Kingdom Ports

Ferromanganese, export.	£9 0s.	to £11 5s.	\$43.74 to \$54.75
Billets, open-hearth....	5 5	to 5 10	25.52 to 26.76
Black sheets, Japanese specifications	10 10		51.03
Tin plate, per base box..	0 15½	to 0 16	3.77 to 3.89
Cents a Lb.			
Steel bars, open-hearth..	7 17½	to 8 7½	1.71 to 1.81
Beams, open-hearth....	7 7½	to 7 17½	1.60 to 1.71
Channels, open-hearth...	7 12½	to 8 2½	1.66 to 1.76
Angles, open-hearth....	7 7½	to 7 17½	1.60 to 1.71
Black sheets, No. 24 gage	8 10		1.84
Galvanized sheets, No. 24 gage	11 0		2.42

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2 9s.	to £2 10s.	\$11.90 to \$12.15
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Billets, Thomas (nominal)	£3 10s.	to £3 11s.	\$17.01 to \$17.25
Wire rods, low C., No. 5 B.W.G.	5 2½	to 5 7½	24.94 to 26.15
Rails, light	6 0		29.20
Black sheets, No. 31 gage, Japanese.....	11 5	to 12 12	54.68 to 58.32
Cents a Lb.			
Steel bars, merchant....	3 17	to 3 19	0.83 to 0.85
Beams, Thomas, British standard (nominal)...	3 10	to 3 12½	0.78 to 0.80
Channels, Thomas, American sections	5 12	to 5 14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick	3 16	to 3 17	0.82 to 0.83
Angles, Thomas, 3-in....	3 18	to 3 19	0.84 to 0.85
Hoop and strip steel over 6-in. base.....	4 7½		0.94
Wire, plain, No. 8 gage..	5 0		1.10
Wire, barbed, 4-pt. No. 12 B.W.G.....	9 6		1.91

PLANT EXPANSION AND EQUIPMENT BUYING



Machine Tool Demand Lacks Definite Trend

March Brought Only Spotty
Improvement at Best, but
Some Losses Are Reported

MACHINE tool business lacks a definite trend. While there are some reports of gains in sales volume in March, there are almost an equal number of losses as compared with February. With such a spotty trade condition, it is impossible to generalize, but it appears probable that the machine tool indus-

try made little, if any, progress toward recovery in March.

Buyers are apparently still waiting for further improvement in general business. While a few are noticeably alert in replacing old machines with new and improved types in order to bring down production costs, the great majority appear to be satisfied to

mark time. Inquiries continue to come in, but only a small portion are turned into orders within a reasonable time after receipt of quotations.

The Milwaukee Road has issued a new list of some 60 items of shop equipment, the largest railroad inquiry that has come before the trade in some time.

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NEW YORK

The machine tool market in the East has given no evidence of a distinct trend. Orders in the past month have continued on a fairly even keel. Though few gains are reported, the volume for most sellers in March was about equal to the February total. Where gains are reported they are accounted for by the greater number of business days in March than in February. Summing up results for the first quarter, some local dealers have done very much better than in the final quarter of 1930, but not so well as in the first quarter of last year.

CHICAGO

The first few days of April find the machine tool market at about the level of the last half of March. Sales are comparatively quiet, but inquiries continue to pile up with little disposition to turn into orders. The Milwaukee Road has issued an inquiry for more than 60 items of shop equipment, which are listed on page 32. There is still some drilling equipment to be purchased by Milwaukee structural steel fabricators and the Santa Fe list is still pending. The Chicago elections will soon be out of the way and the trade hopes that activity will then be renewed on requirements for the Austin high school. The used tool market has quieted considerably in recent weeks. As a general rule dealers' stocks are large.

MILWAUKEE

Considerable encouragement is being imparted in the machine tool trade by orders for more than a single unit, although no large-lot buying is in immediate prospect. A number of buyers have taken two and three machines during the past fortnight, and inquiries are also running beyond the single-unit stage. Orders are largely for standard types, for both replacement and additional capacity. Employment in a number of the larger shops has been considerably improved by the placing of orders for equipment for the new continuous strip mill to be built by Inland Steel Co. at Indiana Harbor. Considerable new equipment will be installed in the automobile license plate and road sign shop at the Wisconsin State Prison, bids closing April 24.

CINCINNATI

Demand for machine tools continues sluggish. While buyers indicate a desire to close on receipt of quotations, general business conditions still cause them to hesitate. Some slight activity has been noted in small automatic lathes, but not in sufficient volume to offset the general slowness of demand. Production continues at low rate, although one builder of planers anticipates improved operations when recent orders leave the engineering department and go to the shop.

CLEVELAND

The machine tool market continues quiet in both sales and inquiry. While sentiment is better in some directions, there is little expectation of a gain in orders during April. Business coming out is mostly for replacement and orders are almost entirely for single machines. Users are showing an interest in replacing present tools with improved machinery with a view of reducing production costs, and more activity is expected in this direction as soon as general conditions improve.

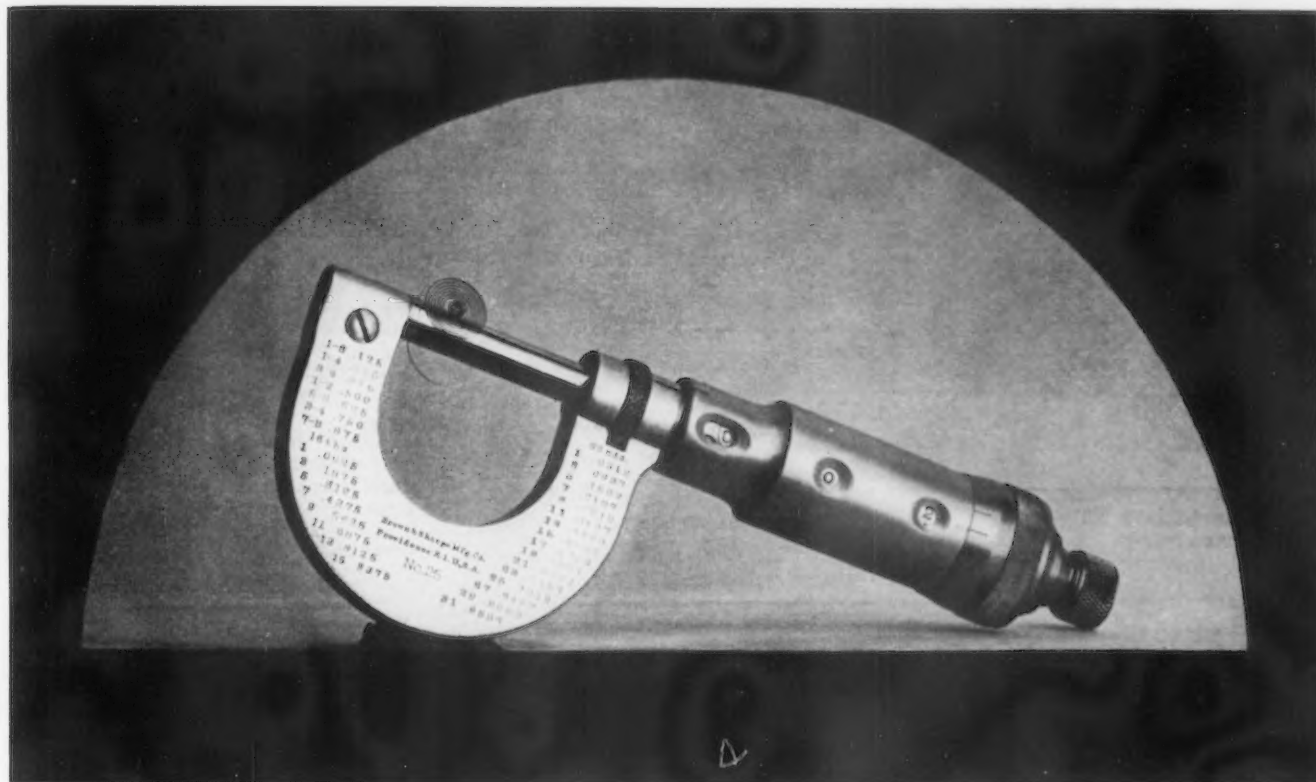
NEW ENGLAND

Some dealers report a slight improvement in machine tool sales, but on account of keen competition are withholding details. The majority of the trade, however, states that business is very quiet, with no indication of a buying movement in the near future. New inquiries are scarce.

Small tool sales are holding up comparatively well, April starting off a little better than March.

PITTSBURGH

Machinery dealers in this district report the market more dull than usual and many consider conditions worse than in the closing months of last year. Inquiry, which was more encouraging in January and February, and resulted in a few orders, has



THE HAIR SPRING PROOF

The Bullard-Dunn Process removes scale without altering the dimensions of the base metal. The hair spring illustrated above was perfectly cleaned without change of dimension or physical properties. Micrometer readings, both before and after treatment, were identical. The Bullard-Dunn Process is a new, simple, economical and highly effective electrochemical method

that eliminates all the objections of former processes. It cleans thoroughly without erosion, leaving surfaces in perfect condition for further operations of machining, grinding, polishing, plating, or galvanizing. Further, it is equally effective on ferrous and non-ferrous metals.

Detailed information on the Bullard-Dunn Process will be sent promptly upon request.

BULLARD-DUNN PROCESS DIVISION

THE BULLARD COMPANY

BRIDGEPORT

CONNECTICUT

BULLARD

again fallen off and prospects for the second quarter seem hardly as good as they were the first three months of the year.

Makers of heavy machinery and equipment for steel mills are fairly busy, but only a few large orders are in prospect. Present order books, however, are sufficient to assure good operations for several months. A Youngstown steel company is reported to have placed a continuous sheet mill with a Pittsburgh district builder.

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Bids will be opened by the Bureau of Supplies and Accounts, Navy Department, for the following machine tools, with point of delivery indicated:

April 14.—34 1/4-in. portable electric drills, Navy Yard, Brooklyn; motor-driven 12-in. tool room lathe, Naval Reserve Aviation base, St. Louis Municipal Airport, Robertson, Mo.

April 21.—Motor driven, 13-in. column, 5-ft. radial drilling machine, Navy Yard, Puget Sound (Bremerton), Wash., one 24-in. and one 32-in. motor-driven metal-working shaper, Navy Yard, Bremerton; motor-driven 19-in. column, 7-ft. radial drilling machine, Bremerton.

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New York

TRACT totaling 130,000 sq. ft., at West Farms Road and East 174th Street, has been purchased by Consolidated Gas Co., 4 Irving Place, New York, for a new central distributing plant, to cost over \$500,000 with equipment. J. F. Hunter is company architect.

Reich-Ash Corp., 307 Fifth Avenue, New York, operating Silvercraft Specialty Co., Green Metal Novelty Corp., and Antique Novelty Box Co., with plant at 59-61 Reade Street, has leased nine-story and basement factory at Tiffany Place and Degraw Street, Brooklyn, totaling 95,000 sq. ft. floor space. Plants will all be moved to new location, which provides double present manufacturing space. Executive offices will be continued at address first noted.

Whitestone Machine & Iron Works, Inc., Whitestone, L. I., has been organized by Alfred A. Peck, 8917 145th Street, Jamaica, L. I., and associates, to take over and expand Whitestone Machine Works, with plant on Eleventh Avenue.

New York Central Railroad Co., 466 Lexington Avenue, New York, has filed plans for a ten-story storage and distributing terminal building, 100 x 103 ft., at 450-56 West Fourteenth Street, to cost \$700,000 with equipment. E. A. Dougherty, address noted, is company architect.

Nathan Rotholz, 122 East Forty-second Street, New York, architect, has taken out a permit for a four-story automobile service, repair and garage building at 130-42 Barrow Street, 119 x 130 ft., to cost \$275,000 with equipment.

Thompson Products, Inc., 2196 Clarkwood Road, Cleveland, manufacturer of valves, automotive parts, etc., has leased about 10,000 sq. ft. floor space at 243-45 West Sixty-seventh Street, New York, for Eastern factory branch, storage and distributing plant.

Julian H. Burgess, 15 Beach Street, Garden City, L. I., and associates have organized Jeffries-Burgess Corp. to operate plant in New York district for manufacture of tools, dies, patterns and kindred engineering specialties. Joseph A. Etelman, 122 Howe Street, Passaic, N. J., is interested in new company.

Port of New York Authority, 80 Eighth Avenue, New York, has awarded contract to Godwin Construction Co., 470 Lexington Avenue, for excavation and foundations for new union inland freight, storage and distributing terminal building at \$855,000; superstructure is scheduled to begin in September. It is estimated to cost over \$15,000,000 with equipment. Engineering department of Port Authority is in charge.

Craig Coal Co., 10 Park Avenue, Rutherford, N. J., has revised plans for a repair shop and automobile service and garage unit, two-stories and basement, 50 x 119 ft., to cost about \$40,000 with equipment. L. B. Huesman and James Dynes, 13-15 Orient Way, are architects.

In connection with purchase of Williams & Clark Division plant of American Agricultural Chemical Co., at Carteret, N. J., now being consummated, American Mineral Spirits Co., 205 East Forty-second Street, New York, will remodel structures for a refractionating plant for production of refined petroleum products, and is arranging fund of over \$400,000 for project.

City Commission, Perth Amboy, N. J., contemplates extensions and improvements in municipal electric power plant, to cost over \$75,000 with equipment. John V. Smith, director of public works, will be in charge.

Plans are in progress for reorganization of New Standard Aircraft Corp., 230 East Sixteenth Street, Paterson, N. J., manufacturer of aeroplanes and parts. It is proposed to dispose of stock issue of \$250,000, portion of fund to be used for extension and betterments in part for manufacture of amphibian aircraft of foreign design, for which American rights are being secured.

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Philadelphia

CONTRACT has been let by Barrett Co., Thirty-sixth Street and Grays Ferry Avenue, Philadelphia, manufacturer of roofing products, to Austin Co., for three three-story units and two one-story

structures, to cost over \$300,000 with equipment.

Philadelphia Gas Works Co., 1401 Arch Street, Philadelphia, has filed plans for a one-story pumping plant at station at Twenty-eighth Street and Passyunk Avenue. Company engineering department is in charge.

Gaseous Products Co., Inc., Camden, N. J., has leased three-story factory at 723-27 State Street, totaling about 12,000 sq. ft. floor space, for manufacture of industrial gases and kindred products.

Joseph A. Barry, 1831 Butler Street, Philadelphia, and associates have organized Acme Turning & Woodworking Co., with capital of \$10,000, and plan operation of local metal and wood-working plant. William F. Barry, address noted, will be an official of company.

Board of Education, Auburn, Pa., is considering installation of manual training equipment in new junior high and grade school, to cost about \$170,000, for which bids have been asked on general contract. Jacoby & Everett, Commonwealth Building, Allentown, Pa., are architects.

Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has applied for permission to acquire plant and property of Parkesburg Gas Co., operating at Parkesburg and vicinity, Chester County, for price of \$115,000, and will consolidate. Expansion and improvements will be carried out, including line construction.

B. Frank Antrim, Merchantville, N. J., and associates have organized Antrim Appliance Co., with capital of \$125,000, and plan operation of factory in this vicinity for manufacture of hardware. E. Hulings Antrim, Merchantville, is interested in new company.

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New England

LANs are being completed by Board of Trustees, Phillips Exeter Academy, Exeter, N. H., for a new central steam power plant, to cost over \$60,000 with equipment. R. D. Kimball Co., 6 Beacon Street, Boston, is engineer.

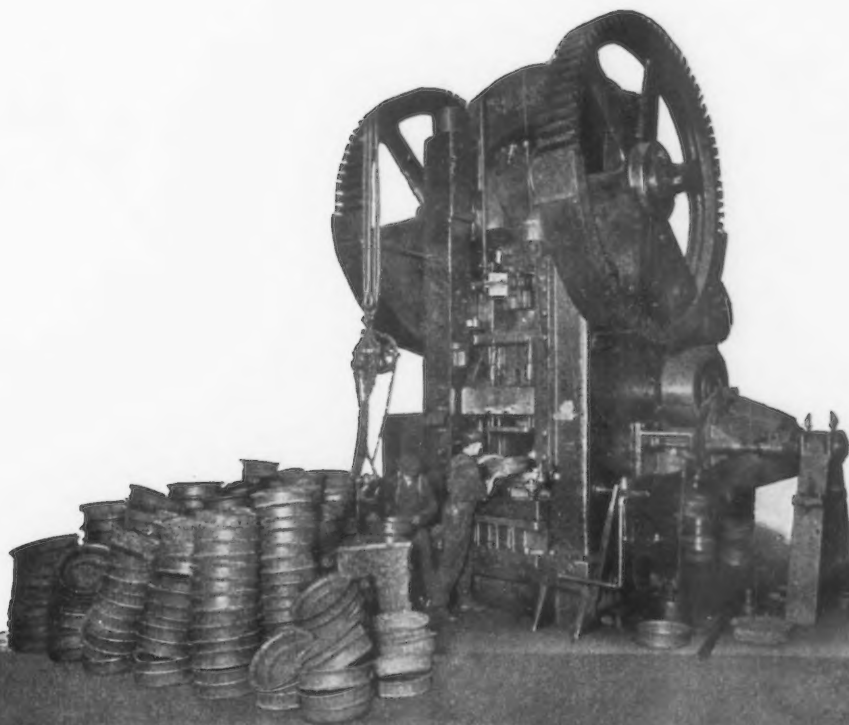
Sinius M. and Holger Hansen, 10 Oakcrest Street, Saugus, Mass., have organized Hansen Engineering & Machinery Co., with capital of \$10,000, and plan operation of a machine shop and foundry at Lynn, Mass. First-noted will be president.

American Writing Paper Co., Inc., Holyoke, Mass., is planning improvements at mill, including electrification of part of plant, to cost close to \$100,000. Company engineering department will be in charge.

Board of Selectmen, Falmouth, Mass., W. M. Denny, chairman, is considering appropriation of \$50,000 for establishment of a municipal airport, including hangar with repair facilities and other field units.

Textile Machinery & Supply Co., Fall





Solving sheet metal problems

FOR 70 YEARS Bliss has been solving sheet metal problems. Small and large parts—a vast variety of shapes—light and heavy gauge metals of every kind—every conceivable requirement is included in the experience accumulated by Bliss during its 70 years of designing machinery for innumerable sheet metal operations.

This unequalled wealth of experience is at your service. It is sure to be of help to you in determining the possibility of improvements or economies in your sheet metal operations. Make Bliss *your* clearing house for sheet metal problems as hundreds of other manufacturers do.

BLISS

E. W. BLISS CO. MAIN OFFICE AND WORKS **BROOKLYN, N. Y., U. S. A.**

Sales Offices: DETROIT CLEVELAND CHICAGO PHILADELPHIA BOSTON ROCHESTER CINCINNATI NEW HAVEN

American Factories: BROOKLYN, N. Y. HASTINGS, MICH. SALEM, OHIO

Foreign Sales Offices and Factories:

ENGLAND, Pocock St., Blackfriars Rd., S. E., London. ITALY, 345 Via Nizza, Turin.
FRANCE, 54 Blvd. Victor-Hugo, St. Ouen Sur Seine, Paris.

River, Mass., care of Walter E. O'Hara, 306 North Main Street, recently formed by Mr. O'Hara and associates, plans operation of local factory for production of textile mill equipment, parts, etc. Mr. O'Hara will be president and treasurer.

Board of Selectmen, West Boylston, Mass., is considering installation of manual training equipment in new one and three-story senior and junior high school, to cost about \$275,000. Cutting, Carleton & Cutting, 44 Front Street, Worcester, Mass., are architects; A. J. Daniels, Shrewsbury, Mass., is consulting architect.

Plant and equipment of H. D. Smith Co., Plantville, Conn., hand tools, will be sold at auction April 15 by court order.

An elevator-fed sand dryer with motor, hot mixer unit, liquid weighing scales, 1000-gal. kettle with electric oil heater and pump, pug mixer and dryer and other equipment is required for a hot asphalt plant to be built by city of Portsmouth, N. H. Charles A. Allen, superintendent of board of public works, is in charge.

John H. Burke, 221 High Street, Wareham, Mass., has been awarded general contract for an illuminating gas plant at Barnstable, Mass., by Cape Cod Gas Co., Hyannis, Mass.

Veeder-Root, Inc., Hartford, Conn., has received a contract from Automatic Signal Corp., New Haven, Conn., to manufacture complete control boxes for latter's automotive traffic dispatching apparatus.

Machinery of Forestville Mfg. Co., Bristol, Conn., was sold recently at public auction to Peter E. Persen, one of original owners, for \$3,500. Auction was held by Court order.

Control of Cheney Bigelow Wire Works, Springfield, Mass., has passed from Pirnie, Simons & Co. to a group of Springfield men and Harold Browne, Plainfield, N. J., associated with National Industrial Conference Board, New York. G. M. Peterson, formerly vice-president of Springfield company, has been made president and treasurer; Ralph E. Freeman, first vice-president; R. G. Edwards, second vice-president; D. A. Benjamin, assistant treasurer. Directors include H. C. Beaver,

former president of Rolls-Royce of America, Inc.; L. B. Howe, vice-president of Western Massachusetts Bank & Trust Co., and H. W. McMullen. Mr. Edwards is also assistant manager of wire works.

Manufacture of nesting bins for tool and stock rooms made by Simplex Tool Co., Woonsocket, R. I., has been taken over by Stackbin Corp., Pearl and Rice Streets, Providence, R. I. These nesting bins will be known as Stackbins, made as individual and sectional units. Additional products are contemplated as part of line.

Chicago

PLANS are under way by Century Airlines, Inc., 5032 West Sixty-third Street, Chicago, for a one-story hangar and terminal unit, with repair facilities, at airport, to cost close to \$75,000 with equipment.

Universal Crusher Co., 625 Avenue C, Cedar Rapids, Iowa, manufacturer of crushing machinery, pulverizers, parts, etc., has plans for a one-story addition, to cost about \$40,000 with equipment. William L. Harrison is general manager.

Minneapolis Gas Light Co., Minneapolis, Minn., is disposing of a bond issue of \$1,000,000, part of proceeds to be used for expansion and improvements in artificial gas plant and system.

Board of Education, Mapleton, Minn., contemplates installation of manual training equipment in new two-story and basement high and grade school to cost \$150,000, for which bids are being asked on general contract until April 21. George Pass & Son, and P. T. Rockey, Eckle Building, Mankato, Minn., are architects; Rose & Harris, 412 Oak Grove Street, Minneapolis, Minn., are engineers.

City Council, Yuma, Colo., L. P. Miller, clerk, is taking bids until April 20 for equipment for municipal power plant, including three steam-driven generating units, 200, 300 and 400-kw. capacity, respectively; one 200 to 250-kw. Diesel engine generator set, with direct-connected exciter and voltage regulator; one sur-

face condenser, stokers, superheaters and auxiliary equipment. Weiland Engineering Co., Thatcher Building, Pueblo, Colo., and 1608 Cook Street, Denver, is engineer.

Conveyor System, Inc., 408 North Lincoln Street, Chicago, recently organized with capital of \$80,000, plans operation of factory for manufacture of conveying equipment, elevators, etc. Company is headed by Arthur Hoeffleur and George Page.

Northern States Power Co., Minneapolis, has arranged for bond issue of \$35,000,000, part of fund to be used for extensions and improvements. Company will carry out expansion at Riverside steam-operated electric generating plant and will make extensions in transmission lines. It is operated by Standard Gas & Electric Co., 231 South La Salle Street, Chicago.

South Atlantic

PURCHASE has been made by Procter & Gamble Co., Inc., Cincinnati, manufacturer of soaps, oils, etc., of plant and business of Portsmouth Cotton Oil & Refining Corp., Portsmouth, Va., manufacturer of cottonseed oil products. Acquired company will be operated as branch plant and expansion carried out.

August Maag Co., Haven and Fleet Street, Baltimore, manufacturer of metal and tinware products for bakers and confectioners, subsidiary of Edward Katzinger Co., Chicago, has awarded general contract to Consolidated Engineering Co., 20 East Franklin Street, Baltimore, for three-story addition, to cost over \$100,000 with machinery. Lockwood Greene Engineers, Inc., Wrigley Building, Chicago, is architect and engineer.

Chemical Warfare Service, Edgewood Arsenal, Md., will receive bids until April 15 for one centrifugal vacuum pump.

Board of Trustees, National Training School for Boys, Washington, has plans for a new one and two-story and basement industrial shop, to cost over \$150,000 with equipment. It is understood that bids will be asked on general contract early in May. Clyde D. Jones is superintendent.

Firestone Tire & Rubber Co., Akron, Ohio, has plans for a factory branch, storage and distributing plant at Augusta, Ga., to cost about \$80,000 with equipment.

Board of District Commissioners, District Building, Washington, has asked bids on general contract for one-story shop unit at Columbia Junior High School, for instruction in automobile repair work. A. L. Harris, address noted, is municipal architect.

Ballentine Packing Co., Greenville, S. C., is planning three-story addition to food products packing plant, 36 x 73 ft., to cost over \$50,000 with conveying and other equipment.

Hood Brick Co., Charlotte, N. C., has purchased plants and businesses of Carolina Shale Brick Co., Norwood, N. C.; Carolina Fire Proofing Co., Gulf, N. C., and Seaboard Shale Brick & Tile Co., Monroe, N. C., and will consolidate under one management, to be known as B. Mifflin Hood Co. Purchasing company will remove executive offices to Norwood and plans expansion at different plant units, including development of Norwood plant for production of roofing tile; fireproofing products will be manufactured at Gulf works. C. H. Boone is president.

Milwaukee Road Issues Inquiry for Shop Equipment

A new list issued by the Milwaukee Road follows:

Two No. 6 multiplex pressure devices.

Four pneumatic wrenches, rotary type.

One motor-driven centrifugal pump, 100 gal. per min.

Nine watt-hour demand meters, 220 volt, 3 phase, 60 cycle.

One portable transformer, 440 and 220 and 110 volts.

Two a. c. volt meters.

One 3 x 18-in. heavy-duty emery grinder.

One 2000-lb. and one 6000-lb. pneumatic hoists.

One oil gear set for flue welder.

One 300-350-lb. electric brass furnace.

One 2½ to 6-in. cylinder grinder.

One 32-in. draw-cut shaper.

One 48-in. throat spot welder.

One ¼-in. to 4-in. pipe threader.

One Micro grinder.

One drill pointer, ½-in. to 3-in.

One 1-ton, 15-ft. lift air-motor hoist.

One 9 x 9-in. power hack saw.

One 5-ft. radial drill.

One 20-in. drill press.

Two 1-ton pneumatic hoists.

One 4 x 10-in. ball-bearing molder.

One complete set square heads.

One 33-kw. frequency changer.

One double-end tenoner, 120 in. length.

One set of refuse cutters.

One pair of two-knife square cope heads.

Two 14 x ¼-in. solid plate grooving saws.

Three 14 x ¼-in. solid plate grooving saws.

One air-operated saw with six 8-in. blades.

One carwheel stripping press.

One burnishing lathe.

One 42-in. wheel-borer.

One air saw.

Two paint spray outfits.

One capstan car puller, 6-hp. motor.

Two heavy-duty double floor grinders.

One electric tool steel hardening furnace.

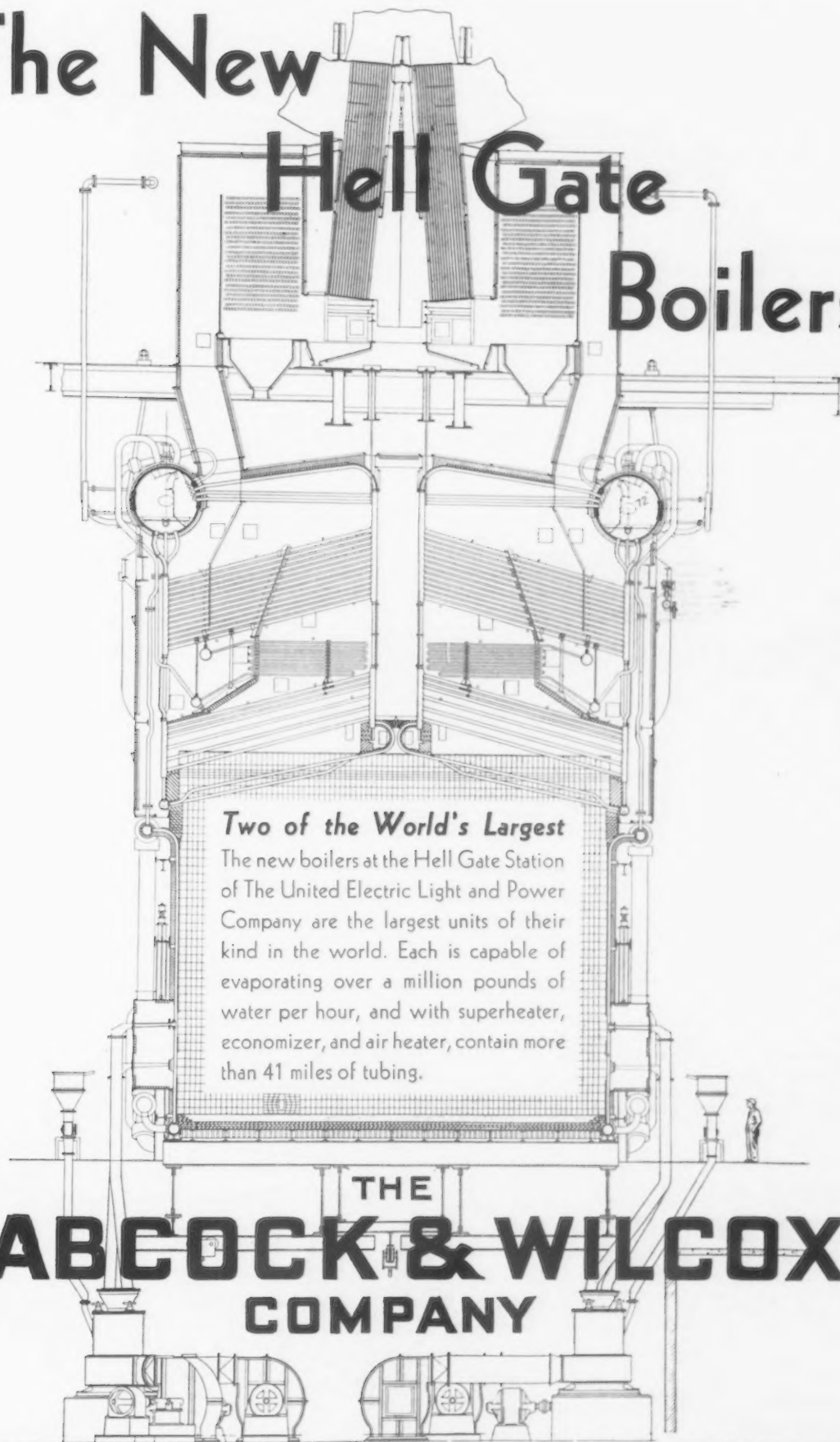
One ½-ton rotary air hoist.

Two 26-in. drill presses.

One universal cutter and tool grinder.

Two standard axle lathes.

The New Hell Gate Boilers



Two of the World's Largest

The new boilers at the Hell Gate Station of The United Electric Light and Power Company are the largest units of their kind in the world. Each is capable of evaporating over a million pounds of water per hour, and with superheater, economizer, and air heater, contain more than 41 miles of tubing.

THE
BABCOCK & WILCOX
COMPANY

85 LIBERTY ST.

NEW YORK, N. Y.

General purchasing officer, Panama Canal, Washington, will receive bids until April 21 for one overhead electric traveling crane; until April 13 for a gasoline engine, 1000 foundry brushes, cable, insulated wire, knife switches, etc.

Buffalo

PLANS are under way by Hecker-Ho Co., Inc., Genesee Building, Buffalo, for a new grain elevator, adjoining mills at 54 Fulton Street, to cost over \$500,000 with equipment. Company engineering department is in charge.

International Business Machines Corp., Endicott, N. Y., manufacturer of calculating machines, parts, etc., has engaged Charles H. Higgins, 101 Park Avenue, New York, architects, to prepare plans for four-story and basement addition, 50 x 56 ft., to cost close to \$100,000 with equipment.

Russell Miller Milling Co., foot of Childs Street, Buffalo, has begun erection of new grain elevator unit, to cost about \$500,000 with equipment. Headquarters are in Security Bank Building, Minneapolis, Minn.

Rochester Gas & Electric Corp., Rochester, N. Y., will dispose of bond issue to total \$23,541,000, part of proceeds to be used for extensions and improvements.

Ludlum Steel Co., Watervliet, N. Y., has established full time working schedules with normal force at plant at Dunkirk, N. Y.

Lake Erie Engineering Corp., Buffalo, has purchased 10 acres at Woodward Avenue and will erect a new factory containing 80,000 sq. ft. of floor space, which will virtually double its production facilities. Company manufactures hydraulic machinery, oil field equipment, special machinery and gray iron and semi-steel castings.

Gulf States

CONTRACT has been let by Arkansas Natural Gas Corp., Shreveport, La., to Ford, Bacon & Davis, Inc., 39 Broadway, New York, engineers, for pipe line from Longview, East Texas oilfield district, to Shreveport, about 70 miles, for service to refinery of Louisiana Oil Refining Corp., a subsidiary, at last-noted place, to cost over \$800,000 with pumping plants and other facilities.

MacDonald-Chilton Boat Co., New Smyrna, Fla., has plans for one-story addition at boat-building and repair plant, to cost over \$35,000 with equipment. Company is contemplating construction of docks for increased capacity.

City Council, Panhandle, Tex., is considering installation of a municipal gas-distributing system, with compressor plant and other facilities, to cost over \$100,000.

Louisiana Development Co., Winnfield, La., a subsidiary of Carey Salt Co., Hutchinson, Kan., is planning new unit at local salt deposits, 76 x 183 ft., to cost over \$90,000 with machinery.

Louisiana Lime & Stone Co., Bastrop, La., care of E. B. Folse, Citizens' Bank & Trust Co. Building, recently organized by Mr. Folse and associates, with capital of \$100,000, has plans for new lime

hydrating plant on local site, to cost over \$75,000 with machinery. Company has lime rock properties in Boone County, Ark., and will develop for raw material supply, installing mining, conveying and other machinery.

Hughes Tool Co., Houston, Tex., manufacturer of rock bits, oil and gas well drilling machinery, pressure valves, etc., is disposing of a bond issue of \$3,000,000, part of proceeds to be used for expansion, including acquisition of certain properties now held by Hughes Industries Co., Ltd., an affiliated organization.

Taylor Refining Co., Tyler, Tex., has secured permission to proceed with erection of new oil refinery about a mile from city, to cost close to \$350,000 with machinery. A pipe line will be constructed for oil supply.

Air Service, Inc., Daytona Beach, Fla., is planning erection of flying service plant at municipal airport, to be operated under direction of Robert W. Orrell, Ocean Dunes Road, including one-story hangar and service unit, with repair facilities, to cost over \$65,000 with equipment.

Humble Oil & Refining Co., Humble Building, Houston, Tex., contemplates new oil storage and distributing plant on Buffalo Bayou, with main structure, 70 x 100 ft., to cost over \$85,000 with equipment. Company engineering department is in charge.

C. W. Young, Archer City, Tex., will build an oil refinery about one mile from city, to cost over \$85,000 with equipment. Part of unit will be given over to production of gasoline.

Southern Pacific Railroad Co., Houston, Tex., will carry out expansion and improvements at locomotive repair shops at Ennis, Tex., including enlargement in engine house and shop facilities to double present capacity, to cost \$50,000. Company engineering department is in charge.

Pittsburgh

PROPERTY at Kittanning, Pa., 200 x 400 ft., fronting on Allegheny River, has been acquired by Gulf Refining Co., Frick Annex, Pittsburgh, for new bulk oil storage and distributing plant, including pumping plant and other units, to cost over \$250,000 with equipment. Company will also build a similar plant at Frackville, Pa., to cost about \$400,000 with equipment.

Tuna Iron Works, Inc., Bradford, Pa., an interest of F. Hamilton Co., Inc., Bradford, manufacturer of oil well equipment and supplies, has acquired former plant



of Elkland Foundry & Machine Co., Elkland, Pa., and will remodel for production of oil drilling and fishing tools, boilers and other plate equipment.

Carnegie Foundry & Machine Co., Carnegie, Pa., has been organized by E. L. McWilliams, 95 Bradford Avenue, Crafton, Pa., and associates, with capital of \$10,000, to operate local foundry for production of brass, bronze, copper and other metal castings. Thomas Ewing, Jr., 202 St. James Street, Pittsburgh, is interested in new company.

Springdale Foundry Co., Springdale, Pa., care of George Chismark, Tarentum, Pa., recently formed by Mr. Chismark and others, has acquired site adjoining Pennsylvania Railroad station at Springdale, and plans erection of one-story foundry to cost over \$35,000 with equipment. Mr. Chismark is secretary and treasurer.

American Austin Car Co., Butler, Pa., manufacturer of automobiles, will discontinue operation in Canada under name of Canadian Austin Car Co., Ltd., with plant at Toronto, and will remove division to Butler, where operations will be concentrated.

Detroit

PLANS have been approved by Stinson Aircraft Corp., Wayne, Mich., manufacturer of airplanes and parts, for one-story addition to main assembling plant and new service hangar, to cost close to \$30,000 including equipment. Company will increase output for production of tri-motor planes.

St. Johns Chamber of Commerce, St. Johns, Mich., is interested in organization of company to take over former local plant of Triangle Truck Co. and establish new works for production of custom-built motor trucks, including parts and assembling. New company will be financed by local interests. C. S. Clark is secretary of Chamber of Commerce.

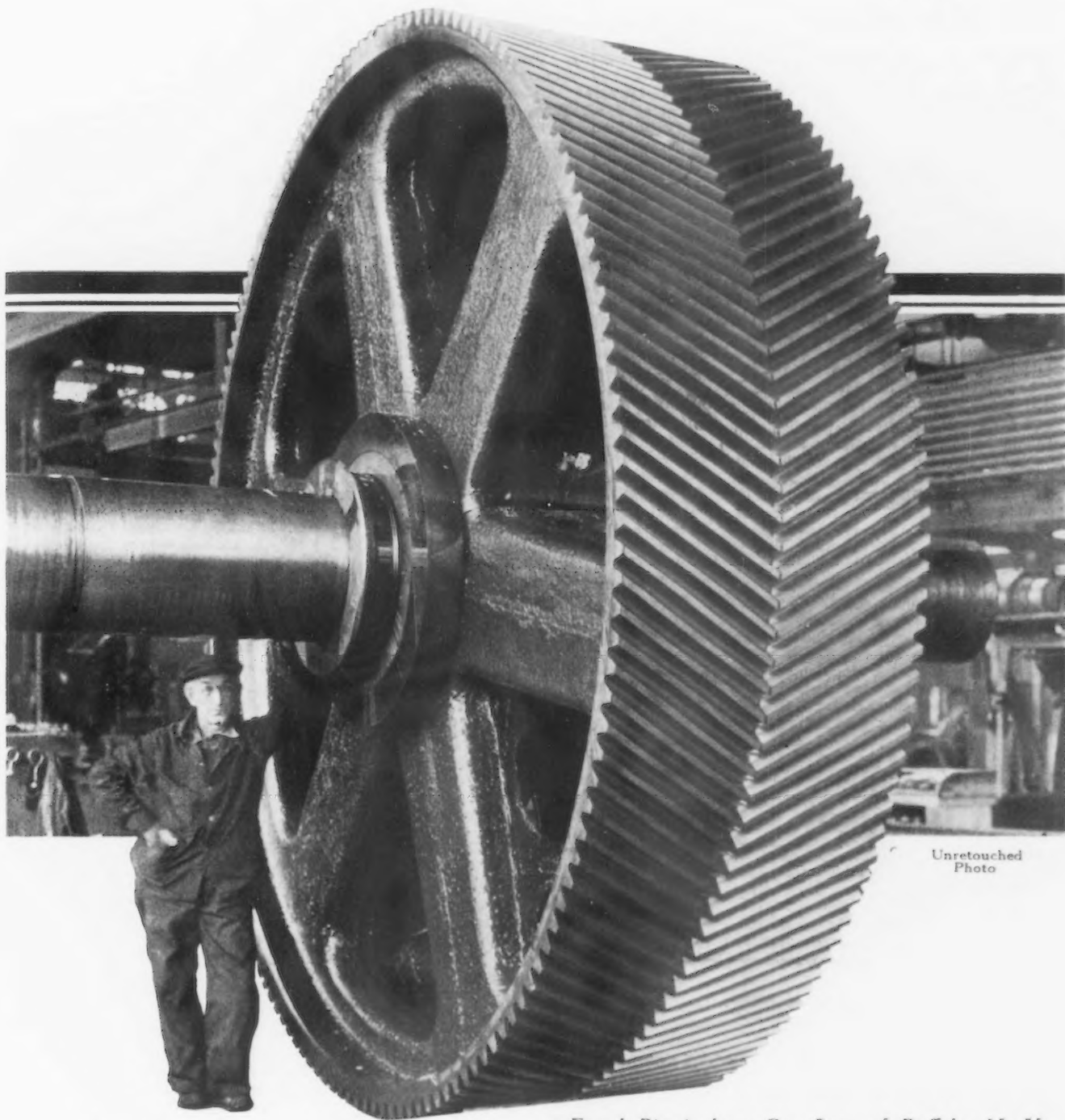
Ford Motor Co., Dearborn, Mich., operating Ford Co. of Canada, Ltd., Toronto, is planning erection of new assembling works at Burnaby, near Vancouver, B. C., where eight acres has been secured, to cost over \$500,000 with equipment.

Board of Education, Grosse Pointe, Mich., contemplates installation of manual training equipment in new two-story and basement school to cost \$300,000, for which bids will be asked soon on general contract. O'Dell & Rowland, Donovan Building, are architects.

Central Public Service Corp., 105 West Adams Street, Chicago, has plans for a new hydroelectric power development at Hersley Rapids, Mich. Initial plant will have capacity of 3200 hp. and will cost about \$400,000 with transmission lines. Output will be used in part by Houghton County Electric Co., an interest of Central company. Contract for power dam has been awarded to Price Brothers, Lansing, Mich.

Consumers Power Co., Jackson, Mich., has arranged appropriation of \$325,200 for extensions and improvements in power plants and systems in Owosso, Mich., district during 1931. A new meter department building will be erected.

Fairmont Stoker Co., Fidelity Trust Co. Building, Detroit, recently organized with capital of \$100,000, is planning establishment of plant for manufacture of a new type of mechanical stoker. A. D. Cronin is president.



Unretouched
Photo

*that its
145 teeth
be
cavity free*

—Farrel Birmingham Co., Inc., of Buffalo, N. Y., selected Birdsboro to cast this 5000 H.P. gear for one of its large customers in the steel industry.

Weighing 51,700 pounds, this gear blank was cast in one piece, hub split, of Birdsboro open hearth steel . . . a carbon steel that runs uniform throughout; that machines clean and holds true to physicals.

Whether it be the complete mechanical installation requiring full design, or a single casting to your own pattern—Birdsboro houses an organization most skilled in the arts of the founder and his coordinates.

BIRDSBORO
STEEL FOUNDRY AND MACHINE COMPANY
DESIGNERS AND BUILDERS
BIRDSBORO, PENNSYLVANIA

Cleveland

PLANs are being considered by American Multigraph Co., 1814 East Fortieth Street, Cleveland, manufacturer of multigraph machines and parts, for a plant addition, bids to be asked early in summer.

Hinde & Dauch Paper Co., Sandusky, Ohio, manufacturer of corrugated paper boxes and containers, has approved plans for new plant at Truro, Nova Scotia, to cost over \$100,000 with machinery. It is scheduled for completion in June and will be operated by Maritime Paper Products, Ltd., a subsidiary.

Insulated Steel Floor & Wall Co., Cleveland, care of Holding, Duncan & Leckie, 1970 Union Trust Building, recently organized by Joseph A. Schlitz and associates, plans operation of local factory for production of steel building products. J. Harold Traverse is interested in company.

City Council, Martins Ferry, Ohio, is planning extensions and improvements in municipal electric light and power plant, including installation of a 2500-kw. turbo-generating unit and auxiliary machinery, to cost about \$90,000. Shover & Loftus, Oliver Building, Pittsburgh, are consulting engineers. O. C. Frantz is service director.

Plain Township Board of Education, Middlebranch, Ohio, A. J. Williams, Ridgeway Place, clerk, plans installation of manual training equipment in new three-story high school, 50 x 200 ft., to cost over \$160,000, for which bids have been asked on general contract. C. E. Firestone and Lowell Christman, Renkert Building, Canton, Ohio, are architects.

Cincinnati

BIDS are being asked until April 21 by Board of Trustees, Ohio State University, Columbus, Ohio, for power plant equipment, including a 4000-hp. turbo-generator unit, horizontal two-pass surface condenser, 5000 sq. ft., and auxiliary equipment. W. C. McCracken is chief engineer.

East & West Desk Co., Athens, Tenn., has purchased property fronting on line of Southern Railway and plans erection of one-story factory for manufacture of desks and other office furniture, to cost over \$35,000 with equipment. J. Ruffner is president.

Cincinnati Motor Terminal Co., 620 West Fourth Street, Cincinnati, has awarded general contract to J. & F. Harig, 1425 Queen City Avenue, for one and two-story and basement service, repair and garage building, 90 x 182 ft., to cost \$70,000 exclusive of equipment. Harry Hake, 2400 Gilbert Avenue, is architect.

Ovens, power equipment, conveying and other machinery will be installed in new plant to be established at Memphis, Tenn., by Tidwell Baking Co., recently organized by H. W. Tidwell, 1337 Herbert Street, to cost over \$40,000 with equipment.

City Council, Harlan, Ky., has plans for a new municipal electric light and power plant, to cost over \$70,000 with machinery. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Memphis Airport Commission, Memphis, Tenn., has awarded general contract to H. A. McGuire & Co., Dermon Building, for one-story addition to hangar, 20 x 120

ft., with repair facilities, to cost close to \$40,000 with equipment.

Layne & Bowler, Inc., Memphis, Tenn., manufacturer of pumping machinery, strainers and kindred equipment, has awarded general contract to Meers & Wallenta, 63 South Third Street, for a one-story addition, 40 x 60 ft., to pattern-making department. Anker F. Hansen, Shrine Building, is architect.

St. Louis

PLANs are under way by Chicago, Rock Island & Pacific Railroad Co., 179 West Jackson Boulevard, Chicago, for an addition to grain elevator at Kansas City, Mo., to cost over \$1,200,000 with machinery. Company is also planning for a new car-icing plant at same place to cost about \$300,000 with equipment. Engineering department is in charge.

Laessig Oil Products, Inc., 314 North Broadway, St. Louis, has asked bids on general contract for a one-story bulk oil storage and distributing plant, 45 x 150 ft., to cost close to \$50,000 with equipment. George R. Bartling, Inc., Paul Brown Building, is architect.

National Air Transport, Inc., 5936 South Cicero Street, Chicago, is contemplating call for bids for one-story hangar, 120 x 120 ft., with 25-ft. lean-to extension, at municipal airport, Kansas City, Mo., to include machine shop and service department, to cost about \$85,000 with equipment. R. H. Higgins is company engineer, address noted.

North American Light & Power Co., operating Kansas Power & Light Co., Topeka, Kan., and other electric light and power properties, has arranged for note issue of \$10,000,000, part of proceeds to be used for extensions and improvements in plants and system.

Beatrice Creamery Co., 2119 Morgan Street, St. Louis, has leased one and two-story building, 102 x 142 ft., to be erected at 1024-26 North Twentieth Street, for storage and distribution, with installation of mechanical-handling equipment, and for automobile service, repair and garage unit, to cost over \$80,000 with equipment. Charles Gray, Chemical Building, is architect.

American Refrigerator Transit Co., Thirteenth Street, St. Louis, operated by Missouri Pacific Railroad Co., Railway Exchange Building, has acquired 4-acre tract at Leeds, Mo., as site for new ice-manufacturing, car-icing and refrigerator plant, to cost over \$300,000 with equipment. Company engineering department, Railway Exchange Building, E. A. Hadley, chief engineer, is in charge.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has leased one-story building, 40 x 100 ft., to be erected at Tulsa, Okla., for factory branch and local service division.

Milwaukee

ORDERS amounting to at least \$1,000,000 have been placed with Milwaukee shops by Inland Steel Co. for new continuous strip mill at Indiana Harbor.

Wisconsin State Board of Control, Capitol Building, Madison, Wis., is taking bids until April 24 on stamping and em-

bossing presses, enameling ovens, etc., for enlargement of automobile license plate and road sign production unit at State prison, Waupun, Wis. Oscar Lee is warden; A. W. Bayley, secretary of board.

Board of Vocational Education, Superior, Wis., closes bids April 8 for new shop building, 100 x 200 ft., one-story, designed by Roland C. Buck, Inc., local engineer, to cost \$100,000 with equipment. Machinery and tools will be purchased later.

Eastman Mfg. Co., 1004 North Eleventh Street, Manitowoc, Wis., manufacturer of hose couplings, will build two additions, 40 ft. sq. and 20 ft. sq., and remodel part of present plant. William J. Rauber, is architect.

City of Hayward, Wis., has approved \$15,000 bond issue for filtration unit of municipal waterworks plant, designed by L. P. Wolff, consulting engineer, 903 Globe Building, St. Paul, Minn. A. W. Johnson is city clerk.

Indiana

BIDS will soon be asked by Board of Trustees, Indiana School for Feeble-Minded Youth, Fort Wayne, for new power plant, including improvements in present heating plant, to cost \$195,000 with equipment. Appropriation in amount noted has been secured. R. W. Noland, Cal-Wayne Building, is consulting engineer. C. A. McGonagle is superintendent.

Art Fleck, Union Title Building, Indianapolis, architect, has awarded general contract to Thomas A. Moynahan Construction Co., same address, for a three-story and basement automobile service, repair and garage building, 120 x 150 ft., at Fort Wayne, to cost close to \$200,000 with equipment. Charles Weatherhogg, 250 West Wayne Street, Fort Wayne, is associate architect.

Spurgeon Brothers Mfg. Co., Muncie, manufacturer of clutches and kindred equipment, has changed its name to Muncie Clutch Co.

Hardy Mfg. Co., Pendleton, manufacturer of sheet metal products, is planning one-story addition, with equipment for considerable increase in output, to cost over \$35,000.

Board of Education, East Gary, plans installation of manual training equipment in new two-story and basement high school to cost \$100,000, for which bids will soon be asked on general contract. Wainwright & Wilkins, Lloyd Building, Hammond, are architects.

Pacific Coast

PLANs are under way by Braun Corp., 363 New High Street, Los Angeles, manufacturer of scientific instruments and apparatus, laboratory equipment, etc., for a two-story storage and distributing plant, 85 x 400 ft., to cost over \$90,000 with equipment. Walker & Eisen, Western Pacific Building, are architects.

Basalt Rock Co., Napa, Cal., is planning a sand and gravel plant on Russian River, near Healdsburg, Cal., with elevating, loading and other handling equipment. An aerial tramway will be installed to connect with line of Northwestern Pacific Railroad. Project will cost over \$100,000.

A Few "Samples" of the INTERESTING IDEAS for you in the Advertisements

New Conveyor Roller Cannot Turn on Its Axle

Gear-tooth lock between inner cone and axle prevents turning on axle. Roller must, therefore, turn on ball bearings.—Page 43.

Non-rusting Steel Machined at 177 s.f.p.m.

Screw-machine operators say that corrosion-resisting steel machines easier than screw-stock. No changes in feeds or speeds are necessary.—Page 16.

Scale Reduction Saves 1% of Ingot Weight

Accurate control of pit atmosphere reduced scale loss 1% in test.—Page 15.

Eliminates Losses in Simple Chucking Jobs

New two-spindle automatic chucker is built specifically for simple chucking jobs that are usually neglected.—Page 21.

Removes Scale Electrochemically

New method removes scale from heat-treated parts without altering dimensions or affecting physical properties. Well adapted for parts with deep recesses.—Page 29.

Giant Boiler Evaporates a Mil- lion Pounds of Water per Hour

New boiler, one of the world's largest, contains more than 41 miles of tubing, including superheater, economizer, etc.—Page 33.

Gear Unit Runs Close to Half Hour on Momentum

Brought up to 700 r.p.m., 450-hp. gear unit on rod mill runs for 28 min. after motor is cut off.—Page 54.

New Low-Cost "Midget" Flexible Coupling

All-steel construction small coupling for shafts up to 1 inch is offered at "remarkably low cost."—Page 55.

Severe Voltage Dip Eliminated by Magnetic Controller

Frequent stopping of large synchronous motor was found to be caused by too hasty starting of a large induction motor in another department. Substitution of magnetic controller for manual type resulted in minimum voltage disturbance.—Page 60.

New Roller-Bearing Is Cageless

Rollers are held in alignment by contact with double rib endplate of the cone.—Page 72.

Acorn Nuts with Stainless Steel Covers

The corrosionless cover, either burnished or polished finish, fits over a steel or brass hexagon nut.—Page 78.

To Remove Paint or Rust Quickly

Wire brush is displaced by new portable electric or pneumatic tool in removing paint, rust, etc., to provide a clean surface for paint.—Page 90.

Combination Spot and Arc Welder

Portable welding machine spot welds up to two pieces of 3/16" steel. Moving one switch changes it to an arc welder with a capacity of 200 amp.—Page 39.

Tougher Castings That Machine Easier

Strength added by using 20% or less charcoal pig iron saves weight. Reduces scrap loss.—Page 17.

Loads 60-ton Car of Scrap in One Hour

Crawler crane, 20-ton, with 45" magnet, lifts about 800 lb. of scrap per load.—Page 11.

To Reduce Your Cleaning Costs

You can buy sheet or strip steel with a protective coating against rust. Easily removed.—Page 102.

***There is a wealth of information in the advertising pages.
It pays to read them regularly.***

▲ ▲ Business as Others See It

Digest of Current Financial and
Economic Opinion

HALTING and uncertain progress in the climb out of the slough of despond is featured by good reports from some lines of activity, partly offset by further recessions in others. Most of the indexes (but not all) show March higher than February and February above January. Those compiled weekly show alternating advances and declines, with the former slowly gaining and causing the trend to move upward.

Favorable Factors Indicate Trends

One interesting observation is made by Poor's: "Examination of the principal economic developments since the first of the year shows that a very large portion of the unfavorable items have been of a surface nature having to do with current events or those already past. On the other hand, the changes in the underlying factors indicating the probable trends in the not-too-distant future have been largely of a distinctly favorable nature."

Of these favorable items, some of which are stressed by other ob-

servers, a few may be cited: Outlook for world trade improved by progress toward better political and business conditions in India and in China; French-Italian naval accord [now less certain of fruition]; fiscal and commercial troubles of Australia and South America in process of readjustment or cure—practically all having been the results of past excesses.

Poor's counsels watching the general buying of every-day commodities and paying less attention to steel production and other "heavy" figures: "Excellent distribution has been going on in goods of ordinary use, as shown by continued large volume of retail store sales and by activity in production of such lines as textiles and shoes."

Thinks Agriculture the Keynote

Along this latter line, *Commerce and Finance* reports a large cotton mill in New England advertising for operatives to help take care of the orders flowing in. But Mr. Price thinks that, in general, "we shall have a revival in business just

as soon as it becomes possible to sell our agricultural production at a profitable price."

Pessimistic tones still feature some expressions of opinion. *Analyst* notes "absence of clear and dependable prospects of early and substantial improvement in areas sufficiently large to be counted on for stimulating business activity as a whole." And the current gain in building contracts is discounted because of the low base from which the gain is figured.

Sees Cyclical Upturn Near

Dividend reductions, in the view of Harvard Economic Society, "reflect conservative policies in a period of low earnings. . . . Experience shows that the lowest level of dividend payments frequently occurs after business has reached bottom." As to business—"significant improvement has occurred in important fields, while some aspects of the price situation are encouraging. . . . These developments . . . make it appear probable that a cyclical upturn in business is in early prospect."

Anaheim Cooperative Orange Association, Anaheim, Cal., has plans for a new ice and precooling plant addition, one story, 55 x 105 ft., to cost about \$75,000 with machinery. H. A. Hamm, 2145 Sacramento Street, Los Angeles, is architect.

National Silicate Products Co., 63 Bluxome Street, San Francisco, is considering a new plant near Redwood City, Cal., for manufacture of a quick-drying cement, to include power house, machine shop and other structures, and to cost over \$175,000 with equipment. Company engineering department will be in charge.

Union Pacific Railroad Co., Omaha, Neb., is planning erection of new power house at Las Vegas, Nev., to cost about \$80,000 with equipment. An overhead traveling crane will be installed. Company engineering department, address noted, will be in charge.

Board of Education, Spokane, Wash., plans installation of manual training equipment in new two and three-story John Rogers High School at Hillyard, to cost about \$450,000, for which bids are being asked on general contract until April 15. John K. Dow and William A. Wells, Hyde Building, are architects.

City Council, Driggs, Idaho, is considering erection of a municipal electric light and power plant, to cost over \$80,000 with equipment.

War Department, Washington, has plans for an army hangar, with repair facilities, at municipal airport at Tucson, Ariz., to cost \$53,000.

City Council, Idaho Falls, Idaho, Harry H. Payne, city clerk, is asking bids until April 17 for equipment for a municipal hydroelectric power plant, including one 1500-kva. generator unit, one 1800-hp.

vertical type water turbine, pumping machinery, transformers, oil insulated switches, switchboard and auxiliary equipment.

Canada

FOLLOWING projects by Montreal Light, Heat & Power Consolidated, Ltd., 107 Craig Street West, Montreal, are proposed for this year: Addition to substation on Atwater Avenue, to cost \$500,000; new substation at St. Lambert, Que.; laying 30 miles of gas mains in connection with new gas holder under construction at Montreal, to cost \$500,000; compressor station at Ville Lasalle, Que., to cost \$40,000. Company's engineering department will be in charge.

Beatty Brothers, Ltd., manufacturer of washing machines, Fergus, Ont., will start work soon on two factory units, 50 x 150 ft. to cost \$100,000.

Crescent Wire & Iron Works, Ltd., 650 Princess Street, Kingston, Ont., has awarded general contract to Thomas A. Andre, 324 Johnston Street, for an addition, 40 x 60 ft.

Foreign

PLANs have been approved by Svenska Cellulosa, A. B., Stockholm, Sweden, an interest of Kreuger & Toll, Stockholm, for increase in capital from 50,000,000 to 100,000,000 kroner (\$13,400,000 to \$26,800,000), large part of fund to be

used for erection of a sulphate plant, work on which has begun. Project will cost over \$5,000,000 with machinery.

Ministry of Agriculture and Department of Commerce and Industry, Cairo, Egypt, have approved plans submitted by Hassan Nashat Pasha, Berlin, Germany (Egyptian Minister to Germany), for a new experimental paper mill near Alexandria, Egypt, initial unit to cost over \$500,000. United States Trade Commissioner at Cairo, Gabriel D. Ferrante, has information regarding project.

In connection with new plant for production of calcium, now under way at Karakliss, Russia, Soviet Russian Government, Moscow, plans to double initial capacity of 10,000 tons a year. Present plant will cost 8,000,000 rubles (about \$4,000,000). Power will be furnished from a hydroelectric generating plant, upon which work has been started. Plans have been completed by Eastern Steel Trust of Soviet Government for a steel foundry at Cheliabinsk, Ural Mountain district, in conjunction with a new steel mill to produce steel for Cheliabinsk tractor plant, machine works at Sverdlovsk, and other metal-working plants in district. Mill and foundry will cost close to 100,000,000 rubles (about \$50,000,000). Amtorg Trading Corp., 261 Fifth Avenue, New York, is official buying agency for Soviet Union.

Ford Motor Co., Ltd., London, England, is negotiating for purchase of three steel plants in New South Wales, to be used for raw material supply for Dagenham works, including Briton Ferry Iron Works, idle for a number of years; Briton Ferry Steel Co. plant, and Whitford galvanizing works of Grovesend Co. It is proposed to consolidate operations under one management.

